

National Bureau of Standards  
Loring, N. W. Bldg.  
APR 28 1950

Reference book not to be  
taken from the Library.

## IONOSPHERIC DATA

ISSUED  
APRIL 1950

U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS  
CENTRAL RADIO PROPAGATION LABORATORY  
WASHINGTON, D. C.



## IONOSPHERIC DATA

## CONTENTS

	Page
Symbols and Terminology; Conventions for Determining Median Values . . . . .	2
Monthly Average and Median Values of World-Wide Ionospheric Data . . . . .	4
Ionospheric Data for Every Day and Hour at Washington, D. C. . . . .	6
Ionosphere Disturbances . . . . .	7
American and Zürich Provisional Relative Sunspot Numbers . . . . .	8
Observations of the Solar Corona . . . . .	9
Preliminary Mean K-Indices, Preliminary International Character Figures, Magnetically Selected Days, Planetary Indices . . . . .	10
Erratum . . . . .	10
Tables of Ionospheric Data . . . . .	11
Graphs of Ionospheric Data . . . . .	45
Index of Tables and Graphs of Ionospheric Data in CRPL-F68 . . . . .	63

## SYMBOLS AND TERMINOLOGY; CONVENTIONS FOR DETERMINING MEDIAN VALUES

Beginning with data reported for January 1949, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Fifth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Stockholm, 1948, and given in detail on pages 2 to 10 of the report CRPL-F53, "Ionospheric Data," issued January 1949.

For symbols and terminology used with data prior to January 1949, see report IRPL-C61, "Report of International Radio Propagation Conference, Washington, 17 April to 5 May, 1944," previous issues of the F series, in particular, IRPL-F5, CRPL-F24, F33, F50, and report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

Following the recommendations of the Washington (1944) and Stockholm (1948) conferences, beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

In addition to the conventions for the determination of medians given in Appendix 5 of Document No. 293 E of the Stockholm conference, which are listed on pages 9 and 10 of CRPL-F53, the following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given on pages 2-9 of CRPL-F53 (Appendices 1-4 of Document No. 293 E referred to above).

a. For all ionospheric characteristics:

Values missing because of A, B, C, F, L, M, N, Q, R, S, or T (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count. See CRPL-F38, page 9.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

Values missing because of W are counted:

1. For foF2, as equal to or less than the median when it is apparent that h'F2 is unusually high; otherwise, values missing because of W are omitted from the median count.
2. For h'F2, as equal to or greater than the median.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of G (no Es reflections observed, the equipment functioning normally otherwise) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.
2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.
3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

## MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD - WIDE IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 35 and figures 1 to 70 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

French Ministry of Naval Armaments (Section for Scientific Research):  
Dakar, French West Africa  
Fribourg, Germany

Institute for Ionospheric Research, Lindau Über Northeim, Hannover,  
Germany:  
Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:  
De Bilt, Holland

Electrical Communications Laboratory, Ministry of Communications:  
Fukaura, Japan  
Tokyo, Japan  
Wakkanai, Japan  
Yamagawa, Japan

New Zealand Department of Scientific and Industrial Research:  
Christchurch, New Zealand (Canterbury University College Observatory)  
Rarotonga I.

Norwegian Defense Research Establishment, Kjeller per Lillestrom, Norway:  
Oslo, Norway

South African Council for Scientific and Industrial Research:  
Capetown, Union of South Africa  
Johannesburg, Union of South Africa

United States Army Signal Corps:  
Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):  
Baton Rouge, Louisiana (Louisiana State University)  
Boston, Massachusetts (Harvard University)  
Guam I.  
Huancayo, Peru (Instituto Geofisico de Huancayo)  
Maui, Hawaii  
San Francisco, California (Stanford University)  
San Juan, Puerto Rico (University of Puerto Rico)  
Trinidad, British West Indies  
Washington, D. C.  
White Sands, New Mexico

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

- a. Differences in scaling records when spread echoes are present.
- b. Omission of values when  $f_{oF2}$  is less than or equal to  $f_{oF1}$ , leading to erroneously high values of monthly averages or median values.
- c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily a blank space in the  $f_Es$  column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of  $f_{oE}$ . Blank spaces at the beginning and end of columns of  $h'F1$ ,  $f_{oF1}$ ,  $h'E$ , and  $f_{oE}$  are usually the result of diurnal variation in these characteristics. Complete absence of medians of  $h'F1$  and  $f_{oF1}$  is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

- a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.
- b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.
- c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot No.					
	1950	1949	1948	1947	1946	1945
December		108	114	126	85	38
November		112	115	124	83	36
October		114	116	119	81	23
September		115	117	121	79	22
August		111	123	122	77	20
July		108	125	116	73	
June		108	129	112	67	
May		108	130	109	67	
April		109	133	107	62	
March	103	111	133	105	51	
February	103	113	133	90	46	
January	105	112	130	88	42	

#### IONOSPHERIC DATA FOR EVERY DAY AND HOUR AT WASHINGTON, D. C.

The data given in tables 36 to 47 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols and Terminology; Conventions for Determining Median Values." Beginning with September 1949, the data are taken at a new location, Ft. Belvoir, Virginia.

## IONOSPHERE DISTURBANCES

Table 48 presents ionosphere character figures for Washington, D. C., during March 1950, as determined by the criteria presented in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

Table 49 lists for the stations whose locations are given the sudden ionosphere disturbances observed on the continuous field intensity recordings made at Ft. Belvoir, Virginia, during March 1950.

Table 50 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Brentwood and Somerton, England, receiving stations of Cable and Wireless, Ltd., for February 14, 15, 20, 21, 22, and 23, 1950.

Table 51 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Colombo, Ceylon, receiving station of Cable and Wireless, Ltd., for January 20, 1950.

Table 52 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Platanos, Argentina, receiving station of the International Telephone and Telegraph Corporation for February 13, 18, and 20, 1950.

Table 53 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Point Reyes, California, receiving station of RCA Communications, Inc., for March 8, 1950.

Table 54 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the New York City, New York, receiving station of Mackay Radio and Telegraph Company, Inc., for February 13 and 20, 1950.

Table 55 lists for the stations whose locations are given the sudden ionosphere disturbances reported by the Institut für Ionosphärenforschung, as observed at Lindau, Harz, Germany, for various days in February 1950.

Table 56 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Barbados, British West Indies, receiving station of Cable and Wireless, Ltd., from February 2 to 22, 1950.

Table 57 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, January 1950, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

The radio propagation quality figures are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner basically the same as that described in IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued February 1, 1946. The scale conversions for each report are revised for use with the data beginning January 1948, and statistical weighting replaces what was, in effect, subjective weighting. Separate master distribution curves of the type described in IRPL-R31 were derived for the part of 1946 covered by each report; data received only since 1946 are compared with the master curve for the period of the available data. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

These radio propagation quality figures give a consensus of opinion of actual radio propagation conditions as reported by the half day over the two general areas. It should be borne in mind, however, that though the quality may be disturbed according to the CRPL scale, the cause of the disturbance is not necessarily known. There are many variables that must be considered. In addition to ionospheric storminess itself as the cause, conditions may be reported as disturbed because of seasonal characteristics such as are particularly evident in the pronounced day and night contrast over North Pacific paths during the winter months, or because of improper frequency usage for the path and time of day in question. Insofar as possible, frequency usage is included in rating the reports. Where the actual frequency is not shown in the report to the CRPL, it has been assumed that the report is made on the use of optimum working frequencies for the path and time of day in question. Since there is a possibility that all disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

#### AMERICAN AND ZÜRICH PROVISIONAL RELATIVE SUNSPOT NUMBERS

Table 58 presents the daily American relative sunspot number,  $R_A$ , computed from observations communicated to CRPL by observers in America and abroad. Beginning with the observations for January 1948, a new method of reduction of observations is employed such that each observer is assigned a scale-determining "observatory coefficient," ultimately referred to Zürich observations in a standard period, December 1944 to September 1945, and a statistical weight, the reciprocal of the variance of the observatory coefficient. The daily numbers listed in the table are the weighted means of all observations received for each day. Details of the procedure are given in the Publication of the Astronomical Society of the Pacific, issued February 1949, in an article entitled "Reduction

of Sunspot-Number Observations." The American relative sunspot number computed in this way is designated  $R_A$ . It is noted that a number of observatories abroad, including the Zürich observatory, are included in  $R_A$ . The scale of  $R_A$  was referred specifically to that of the Zürich relative sunspot numbers in the standard comparison period; since that time,  $R_A$  is influenced by the Zürich observations only in that Zürich proves to be a consistent observer and receives a high statistical weight. In addition, this table lists the daily provisional Zürich sunspot numbers,  $R_Z$ .

## OBSERVATIONS OF THE SOLAR CORONA

Tables 59 through 61 give the observations of the solar corona during March 1950 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 62 through 64 list the coronal observations obtained at Sacramento Peak, New Mexico, during February 1950, derived by the High Altitude Observatory from spectrograms taken by Harvard University as a part of its performance of an Air Materiel Command research and development contract administered by the Air Force Cambridge Research Laboratories. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 59 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 60 gives similarly the intensities of the first red (6374A) coronal line; and table 61, the intensities of the second red (6704A) coronal line; all observed at Climax in March 1950.

Table 62 gives the intensities of the green (5303A) coronal line; table 63, the intensities of the first red (6374A) coronal line; and table 64, the intensities of the second red (6704A) coronal line; all observed at Sacramento Peak in February 1950.

The following symbols are used in tables 50 through 64: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

PRELIMINARY MEAN K-INDICES, PRELIMINARY  
INTERNATIONAL CHARACTER FIGURES, MAGNETICALLY  
SELECTED DAYS, PLANETARY INDICES

Table 65 gives preliminary mean K-indices,  $K_w$ , and international character figures, C,  $K_p$ , and also final magnetically selected days from magnetic observatories widely distributed over the Earth's surface. The selected days are preferentially derived using the four magnetic criteria: C-figures, sums of the eight daily mean K-indices, the greatest daily K-index, and the sums of the squares of the eight daily K-indices.

$K_p$  is designed to measure solar particle-radiation by its magnetic effects at eleven observatories between geomagnetic latitudes 47 and 63 degrees. Complete description of  $K_p$  has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948" published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. This bulletin has tables of  $K_p$  for 1945-48. Current tables of  $K_p$  appear in the Journal of Geophysical Research.

These tables have been furnished by the courtesy of the Committee on Characteristics of Magnetic Disturbance, ATME, IUGG. The majority of the world's magnetic observatories have cooperated in supplying the data. The Meteorological Office, De Bilt, Holland, has efficiently assembled and compiled the summary tables. The Chairman of the Committee has compiled  $K_p$  to supply the need of research workers in the ionospheric field for a specific index of solar particle-activity. Tables of  $K_p$  will ultimately be available from January 1, 1937, the beginning date for serious ionospheric records.

ERRATUM

CRPL-F67, p. 59, fig. 63: At 1000 and from 1400 through 1900, the foF2 curve should be labeled > 9.0 instead of < 9.0.

# TABLES OF IONOSPHERIC DATA

**Table 1**

Time	March 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	290	5.7					2.7
01	290	(5.4)					(2.7)
02	290	(5.2)					2.7
03	290	4.8					2.7
04	280	4.2					2.7
05	290	4.0					2.7
06	280	4.0					2.9
07	250	6.1	---	---	120	2.1	2.2
08	240	7.9	220	---	100	2.7	2.1
09	230	8.7	220	---	100	3.1	2.0
10	270	9.4	210	---	100	3.3	2.0
11	280	10.1	210	1.0	100	3.5	2.9
12	280	10.5	210	4.9	(100)	3.6	2.9
13	280	10.6	220	5.0	100	3.5	2.8
14	290	10.5	220	5.9	100	3.4	2.8
15	270	10.5	220	---	100	3.2	2.8
16	230	10.2	240	---	100	3.0	2.9
17	250	9.2	---	---	110	2.5	2.9
18	240	(9.5)	---	---	1.7	(3.0)	(2.9)
19	230	(8.5)					(2.8)
20	240	(7.6)					(2.8)
21	260	(7.0)					(2.8)
22	270	6.2					2.8
23	280	5.9					2.7

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

**Table 2**

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	290	3.1					2.7
01	295	2.9					2.9
02	305	2.5					2.8
03	310	2.2					2.9
04	310	2.3					2.8
05	300	2.5					2.7
06	275	2.6					2.8
07	250	3.2					2.8
08	230	5.2					2.8
09	230	7.4	---	---			(3.2)
10	230	8.3	235	---			3.2
11	230	9.1	230	---			3.2
12	230	9.4	230	---			3.2
13	230	9.2	230	---			3.2
14	235	9.5	230	---			3.2
15	225	9.4	---	---			3.2
16	220	8.6					3.2
17	220	7.6					2.8
18	220	7.2					3.2
19	225	5.8					3.1
20	240	4.3					(3.0)
21	265	4.1					(2.9)
22	260	3.8					(2.8)
23	275	3.3					2.4

Time: 15.0°E.

Sweep: 1.6 Mc to 10.0 Mc in 5 minutes, automatic operation; experimental recorder, 1.3 Mc to 14.0 Mc in 8 minutes.

**Table 3**

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	280	4.5					2.6
01	270	4.6					2.7
02	280	4.4					2.6
03	270	4.4					2.7
04	280	4.3					2.7
05	250	3.9					2.7
06	250	3.9					2.8
07	250	6.0	---	---	3.0		
08	240	8.1	---	---	3.1		
09	240	9.9	---	---	3.0		
10	240	9.9	---	---	(3.0)		
11	250	10.4	---	---	3.0		
12	250	10.3	---	---	(2.9)		
13	250	10.3	---	---	(3.0)		
14	250	10.3	---	---	(2.9)		
15	250	10.0	---	---	3.0		
16	235	10.0	---	---	3.0		
17	230	9.7	---	---	3.0		
18	220	7.9			(2.9)		
19	230	6.6			2.8		
20	240	5.9			2.9		
21	240	5.8			2.8		
22	255	5.3			2.7		
23	260	4.9			2.7		

Time: 75.0°W.

Sweep: 0.8 Mc to 14.0 Mc in 1 minute.

**Table 4**

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	300	3.4					2.6
01	280	3.5					2.8
02	300	3.3					2.7
03	280	3.4					2.6
04	290	3.4					2.7
05	280	3.3					2.6
06	300	3.3					2.7
07	250	5.5					1.8
08	230	8.2					3.4
09	240	9.4	240	---			3.3
10	250	10.2	220	---			3.2
11	260	10.7	220	4.8			3.1
12	260	11.5	220	---			3.1
13	260	11.4	230	---			3.0
14	260	11.3	240	---			3.0
15	240	11.0	240	---			3.1
16	240	10.6	---	---			2.8
17	240	10.2	---	---			3.2
18	220	8.8	---	---			2.4
19	220	6.9	240	---			2.4
20	230	5.6	---	---			3.1
21	240	4.2	---	---			3.1
22	280	3.3	---	---			2.8
23	300	3.5	---	---			2.2

Time: 120.0°W.

Sweep: 1.3 Mc to 18.0 Mc in 4 minutes.

**Table 5**

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	280	3.9					2.8
01	280	3.9					2.8
02	270	4.0			2.3	2.8	
03	260	4.0			2.2	2.8	
04	260	4.0					2.9
05	270	3.6					2.8
06	280	3.8					2.7
07	240	6.2	---	---	3.2		
08	230	8.6	120	2.6	3.3		
09	230	9.8	---	---	3.0	3.2	
10	220	10.4	220	---	3.3	3.1	
11	260	11.4	220	---	3.6	3.0	
12	260	11.4	220	---	3.6	3.0	
13	260	11.4	220	---	3.7	4.0	2.9
14	240	11.4	220	---	3.6	4.2	2.9
15	240	11.2	---	---	3.4	4.2	2.9
16	240	10.8	120	2.8	3.8	3.0	
17	230	10.4	120	2.3	3.2	3.1	
18	220	9.4			2.6	3.2	
19	220	7.2			2.4	3.1	
20	220	5.9			2.5	3.1	
21	230	4.5			2.4	3.0	
22	260	4.0					2.8
23	280	4.0					2.8

Time: 105.0°W.

Sweep: 0.8 Mc to 14.0 Mc in 2 minutes.

**Table 6**

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	300	4.1					2.8
01	300	4.3					2.9
02	300	4.2					2.9
03	290	4.3					2.9
04	290	4.2					3.0
05	290	4.0					3.0
06	300	4.0					2.8
07	260	6.5					3.1
08	250	8.6	240	---	---	---	3.2
09	270	9.6	250	---	120	3.0	
10	(280)	10.4	240	---	120	3.1	
11	290	11.0	240	---	120	3.4	
12	290	11.4	240	---	120	---	2.9
13	290	11.5	240	---	120	3.5	
14	290	11.4	250	---	120	3.5	
15	280	11.2	260	---	120	3.3	
16	(270)	11.0	250	---	120	3.0	
17	240	10.6	---	---	130	2.5	
18	230	9.5					3.1
19	230	7.5					3.0
20	260	5.7					3.0
21	270	5.0					3.0
22	290	4.4					2.9
23	300	4.2					2.8

Time: 90.0°W.

Sweep: 2.12 Mc to 14.1 Mc in 5 minutes, automatic operation.

Table 7

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	250	7.1					3.0
01	250	6.5					3.0
02	240	6.0					2.9
03	230	5.8					3.1
04	200	4.7					3.2
05	260	2.9					3.0
06	290	2.8					2.9
07	260	5.5	4.5	---			3.0
08	240	9.0	7.5	2.7			3.1
09	250	11.5	---	---			3.0
10	260	13.0	---	---			(3.0)
11	270	(15.3)	---	---			(3.0)
12	270	(15.0)	---	---			(3.0)
13	280	(15.5)	---	---			(3.0)
14	280	(15.0)	---	---			(3.0)
15	270	(15.2)	---	---			(3.0)
16	260	(15.0)	---	---			(3.0)
17	250	(15.5)	---	---			2.2
18	230	(15.0)	15.0	---			1.8
19	200	(13.5)					2.3
20	210	9.8					3.0
21	220	10.5					3.0
22	210	(9.8)					(3.0)
23	220	9.0					3.0

Time: 135.0°E.

Sweep: 1.0 Mc to 24.0 Mc in 1 minute.

Table 9

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	280	(6.0)					2.7
01	260	6.2					2.9
02	250	5.4					3.0
03	240	4.9					3.0
04	---	4.4					2.9
05	---	4.0					2.9
06	---	3.8					2.9
07	260	6.5	---	---			3.0
08	240	8.7	3.5	8			3.1
09	260	10.0	---	---			3.1
10	280	11.1	---	---			3.1
11	280	11.2	5.0	---			3.0
12	290	11.2	5.2	---			2.9
13	300	11.4	---	---			2.8
14	290	11.7	5.2	3.8			2.8
15	290	11.5	---	---			2.9
16	280	11.1	---	---			2.8
17	270	11.2	---	---			2.9
18	250	11.2					2.9
19	240	9.3					3.0
20	240	7.2					2.9
21	280	6.0					2.8
22	290	5.6					2.8
23	280	(5.6)					2.7

Time: 60.0°W.

Sweep: 2.9 Mc to 13.0 Mc in 9 minutes, automatic operation; supplemented by manual operation.

Table 11

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	230	10.0					5.1
01	230	8.5					3.4
02	240	6.9					4.7
03	230	6.1					3.0
04	240	5.7					5.2
05	230	5.0					3.1
06	270	5.8					3.2
07	240	9.3					3.1
08	240	11.3	220	---			3.2
09	290	12.3	220	5.2			3.2
10	300	12.6	210	5.4			3.6
11	300	12.4	210	5.3			2.4
12	300	11.6	200	5.3			12.6
13	300	11.6	200	5.3			2.3
14	300	11.2	200	5.1			12.6
15	290	11.4	200	5.0			2.3
16	220	11.3	---	---			12.6
17	240	11.6					2.2
18	270	11.1					2.2
19	320	10.6					2.2
20	360	10.7					2.2
21	330	10.4					2.8
22	280	10.1					2.6
23	260	(10.8)					3.7

Time: 75.0°W.

Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 8

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	270	5.8					2.7
01	280	6.3					2.8
02	260	4.7					3.0
03	250	4.3					3.3
04	260	2.8					2.9
05	300	2.4					2.6
06	340	2.4					2.5
07	300	5.1					2.8
08	270	8.4					3.0
09	280	10.0	250	---			2.9
10	300	11.4	240	---			2.9
11	320	12.7	240	(4.9)			2.8
12	320	13.2	230	(5.2)			2.7
13	340	14.0	240	5.5			2.7
14	340	14.8	250	(5.6)			2.7
15	320	14.8	250	5.4			2.8
16	300	14.5	260	---			2.8
17	270	14.2	260	---			2.9
18	250	12.8					4.4
19	240	11.3					3.0
20	240	10.0					2.8
21	260	7.5					2.6
22	260	6.9					2.9
23	260	6.5					2.7

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 10

Time	February 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	230	10.1					4.1
01	230	10.0					4.0
02	230	9.3					3.3
03	210	6.4					3.2
04	230	5.2					1.5
05	240	4.6					3.0
06	240	3.9					2.8
07	260	6.2					3.1
08	240	8.8	220	---			4.6
09	250	10.6	220	---			5.0
10	280	11.4	210	4.7			5.6
11	280	11.8	200	4.8			4.8
12	280	11.0	200	4.8			2.5
13	280	11.0	200	4.8			2.4
14	280	11.4	200	4.8			5.0
15	280	11.8	210	---			4.9
16	240	12.4	220	---			5.0
17	250	12.7					2.6
18	260	12.6					5.0
19	290	12.4					3.2
20	310	(11.6)					(2.5)
21	280	(11.4)					2.5
22	260	(10.7)					2.4
23	250	10.1					3.0

Time: 150.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 12

Time	January 1950						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	315	3.3					2.5
01	320	3.2					2.3
02	320	3.0					2.5
03	315	2.7					2.4
04	310	2.6					2.6
05	300	2.5					2.3
06	300	2.5					2.2
07	270	3.7					2.7
08	220	6.8					3.1
09	220	8.7	---	---			3.1
10	225	9.9	220	3.4			3.2
11	225	10.4	248	3.6			2.8
12	225	10.1	225	3.5			3.1
13	232	10.4	230	3.6			3.0
14	230	10.3	---	---			3.1
15	220	9.2	---	---			2.0
16	220	8.5					2.6
17	220	6.8					2.3
18	225	5.7					3.0
19	250	4.5					2.8
20	280	3.7					2.7
21	300	3.4					2.6
22	310	3.4					1.8
23	310	3.3					2.4

Time: 0.0°.

Sweep: 1.4 Mc to 16.0 Mc in 7 minutes, automatic operation.

Table 13

Linden/Harz, Germany ( $51.6^{\circ}\text{N}$ , $10.1^{\circ}\text{E}$ )							January 1950	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	290	3.2					1.8	
01	300	3.2					1.7	
02	300	3.2					2.0	
03	300	3.0						
04	290	2.6						
05	290	2.6						
06	260	2.6						
07	270	2.6						
08	220	5.0					2.0	
09	210	7.8						
10	210	9.0						
11	215	9.8						
12	215	10.0						
13	210	10.1						
14	220	10.3						
15	215	9.7						
16	210	8.8						
17	205	7.8						
18	205	6.2						
19	210	5.2						
20	230	4.0						
21	270	3.6						
22	290	3.4						
23	300	3.1						

Time:  $15.0^{\circ}\text{E}$ .

Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 14

Trinidad, Brit. West Indies ( $10.6^{\circ}\text{N}$ , $61.2^{\circ}\text{W}$ )							January 1950	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	230	6.4						
01	240	5.4						
02	230	4.6						
03	230	4.1						
04	260	3.6						
05	260	3.9						
06	250	4.4						
07	240	8.0						
08	220	10.4						
09	240	12.6						
10	250	12.0						
11	250	11.4						
12	250	11.6						
13	270	12.0						
14	280	12.1						
15	270	11.8						
16	260	11.8						
17	240	11.6						
18	220	10.8						
19	220	9.8						
20	220	8.0						
21	250	6.8						
22	260	7.0						
23	240	6.6						

Time:  $60.0^{\circ}\text{W}$ .

Sweep: 1.5 Mc to 18.0 Mc, manual operation.

Table 15

Johannesburg, Union of S.Africa ( $26.2^{\circ}\text{S}$ , $28.0^{\circ}\text{E}$ )							January 1950	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	280	6.1					2.5	2.8
01	260	5.8					2.3	2.8
02	260	5.4					2.2	2.8
03	260	4.9					2.1	2.8
04	260	4.2					2.0	2.8
05	280	4.1						2.8
06	250	5.8					3.0	
07	(280)	7.5						
08	320	8.7					3.2	
09	320	9.6					3.8	
10	340	9.9					2.7	
11	350	10.4					2.7	
12	350	10.5					2.8	
13	360	10.6					2.8	
14	350	10.6					2.7	
15	330	10.2					2.7	
16	320	10.0					2.8	
17	300	9.3					2.8	
18	270	8.8					2.8	
19	260	8.6					2.9	
20	250	8.3					2.9	
21	250	7.6					2.8	
22	260	6.8					2.8	
23	280	6.4					1.5	2.8

Time:  $30.0^{\circ}\text{E}$ .

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 16

Capetown, Union of S.Africa ( $34.2^{\circ}\text{S}$ , $18.3^{\circ}\text{E}$ )							January 1950	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	(290)	5.1						2.6
01	(280)	5.0						2.7
02	(280)	5.0						3.0
03	(280)	5.0						2.8
04	(270)	4.6						2.8
05	(280)	4.1						2.1
06	270	5.0						2.7
07	(280)	6.7						2.9
08	320	8.0						3.0
09	340	9.1						2.7
10	360	9.3						2.7
11	360	9.6						2.6
12	370	10.0						2.7
13	360	10.2						2.6
14	350	10.1						2.7
15	350	9.8						2.7
16	350	9.5						2.7
17	320	9.0						2.8
18	300	8.6						2.8
19	270	8.1						2.9
20	250	7.7						2.9
21	(240)	7.0						2.9
22	(250)	6.2						2.9
23	(270)	5.5						2.8

Time:  $30.0^{\circ}\text{E}$ .

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 17

De Bilt, Holland ( $52.1^{\circ}\text{N}$ , $5.2^{\circ}\text{E}$ )							December 1949	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	320	3.0					2.3	2.4
01	330	2.8					2.4	(2.4)
02	320	2.9					2.3	(2.4)
03	300	2.9					2.4	2.5
04	295	3.1					2.5	2.6
05	280	2.8					2.4	2.7
06	280	2.6					2.3	2.7
07	240	4.1					2.5	2.7
08	220	7.8					2.8	3.1
09	220	10.2					2.6	3.1
10	220	11.5					2.5	3.1
11	220	12.2					2.7	3.1
12	225	12.4					2.6	3.0
13	220	12.1					2.6	3.0
14	220	11.5					2.6	3.0
15	215	10.5					2.4	3.1
16	210	9.0					3.0	
17	210	6.7					1.9	3.0
18	220	5.2					2.9	
19	235	4.3					2.8	
20	275	3.6					2.9	
21	290	3.2					2.6	
22	310	3.1					2.5	
23	315	3.2					2.5	

Time:  $0.0^{\circ}$ .

Sweep: 1.4 Mc to 16.0 Mc in 7 minutes, automatic operation.

Table 18

Christchurch, New Zealand ( $43.5^{\circ}\text{S}$ , $172.7^{\circ}\text{E}$ )							December 1949	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	280	8.3						3.3
01	290	7.7						3.0
02	290	6.9						2.5
03	290	6.6						2.5
04	300	6.4						2.6
05	270	7.1						2.8
06	280	7.8						2.8
07	320	8.8						3.2
08	320	9.0						3.5
09	330	9.4						3.6
10	360	9.6						4.7
11	370	9.5						5.0
12	370	9.3						5.2
13	380	9.2						5.2
14	380	9.1						5.0
15	370	9.0						4.7
16	360	8.9						4.3
17	(330)	8.7						4.3
18	---	8.4						3.1
19	280	8.6						3.5
20	300	9.0						3.4
21	290	9.3						2.8
22	290	9.4						2.6
23	280	9.1						2.6

Time:  $172.5^{\circ}\text{E}$ .

Sweep: 1.0 Mc to 13.0 Mc.

Table 19

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	300	4.5				2.1
01	310	4.2				2.6
02	300	4.4				2.2
03	300	4.2				2.3
04	300	4.3				2.5
05	280	4.2				2.0
06	260	4.5	---	---	100	1.6
07	220	8.2	230	---	100	2.3
08	220	11.4	250	---	100	2.5
09	210	(12.6)	220	---	100	2.8
10	230	(13.1)	220	---	100	3.2
11	220	(13.6)	220	---	100	3.2
12	220	(12.9)	210	---	100	3.2
13	230	(12.8)	220	---	100	3.1
14	210	(12.2)	220	---	100	2.9
15	210	12.0	---	---	100	2.5
16	220	10.5	210	---	100	1.8
17	210	(8.1)	220	---	100	1.3
18	220	7.6				2.2
19	230	6.5				2.2
20	240	5.3				3.0
21	270	4.5				1.6
22	300	4.7				2.8
23	290	4.5				2.0

Time: 135.0°E.

Sweep: 1.0 Mc to 14.0 Mc in 15 minutes, manual operation.

Table 21

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	280	4.4				2.6
01	280	4.2				2.4
02	280	4.2				2.0
03	280	4.2				2.6
04	260	4.0				2.9
05	280	4.0				2.8
06	230	5.3	---	---	100	1.1
07	220	9.5	---	---	110	2.2
08	220	11.2	---	---	100	2.8
09	220	13.1	220	---	100	3.2
10	220	13.8	230	---	100	3.4
11	220	13.3	220	---	100	3.5
12	230	13.4	220	---	100	3.5
13	240	14.0	230	---	100	3.4
14	230	13.4	220	---	100	3.2
15	230	12.5	230	---	100	3.0
16	220	11.8	---	---	100	2.3
17	210	10.3	---	(1.4)	100	3.0
18	220	8.1				2.7
19	230	7.2				3.0
20	230	6.1				2.0
21	230	5.1				3.1
22	250	4.8				2.0
23	270	4.5				2.8

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 23

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	290	10.0				3.0
01	290	9.7				2.6
02	300	9.5				2.8
03	290	8.6				2.8
04	300	8.0				2.8
05	300	7.8				2.5
06	260	9.2	---	---	120	2.3
07	260	11.4	250	---	110	3.1
08	290	11.8	240	6.1	110	3.6
09	300	12.0	250	6.6	110	3.8
10	320	12.5	280	7.8	110	4.0
11	350	13.2	290	7.5	110	4.0
12	360	14.4	310	8.0	110	---
13	350	14.5	320	7.6	110	4.0
14	350	14.6	310	6.9	110	---
15	350	14.4	260	7.0	110	3.9
16	340	13.0	250	6.6	110	3.4
17	310	12.0	250	5.6	110	3.1
18	290	11.5	---	---	2.3	4.1
19	300	11.6				4.2
20	330	10.8				4.1
21	340	10.1				2.7
22	320	10.2				3.7
23	300	10.0				2.7

Time: 157.5°W.

Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 20

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	320	4.5				2.1
01	320	4.6				2.2
02	340	4.6				2.5
03	320	4.6				2.7
04	310	4.5				2.5
05	300	4.5				2.7
06	270	5.2				2.0
07	230	8.9				2.8
08	220	10.5				3.2
09	230	11.6				3.3
10	220	(12.4)				3.2
11	230	(12.1)				4.2
12	220	(11.6)				(3.6)
13	220	11.8				(3.4)
14	220	12.1				(3.1)
15	220	11.4				3.2
16	220	11.0				3.1
17	220	9.3				3.1
18	240	7.8				3.0
19	240	7.0				3.1
20	260	5.7				3.1
21	280	4.6				2.9
22	300	4.7				2.7
23	300	4.6				2.7

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 22

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	280	5.4				2.8
01	290	5.0				2.8
02	280	4.8				2.8
03	270	4.8				2.9
04	260	4.2				3.0
05	280	3.5				2.7
06	290	3.8				2.8
07	260	7.6	---	---	150	1.9
08	240	10.2	---	---	110	2.6
09	250	12.0	230	---	110	3.0
10	250	13.4	230	---	110	3.3
11	260	13.2	240	---	110	3.6
12	270	13.4	230	---	110	3.6
13	280	13.8	230	---	110	4.4
14	270	13.8	240	---	110	3.4
15	260	13.6	240	---	110	3.2
16	250	13.1	240	---	110	2.8
17	240	12.9	240	---	2,2	3.2
18	230	11.0	---	---	---	3.0
19	230	9.5				2.6
20	240	8.7				2.4
21	230	8.0				3.0
22	250	6.8				2.9
23	270	5.7				2.8

Time: 135.0°E.

Sweep: 1.2 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 24

Time	November 1949					
	h'F2	foF2	h'Fl	foFl	h'E	foE
00	300	7.8				2.9
01	300	7.3				2.5
02	300	6.8				2.4
03	300	6.2				2.4
04	310	6.0				2.9
05	280	6.2	---	---	1,6	2.7
06	260	6.7	260	4.2	2,6	3.0
07	410	7.4	250	4.9	3,2	4.4
08	360	8.0	240	5.3	3,5	4.2
09	370	8.8	240	5.5	3,6	3.8
10	390	9.2	240	5.9	3,7	3.6
11	380	9.6	230	5.8	3,8	4.4
12	400	9.5	240	6.0	3,8	4.4
13	380	9.5	240	6.0	3,7	3.8
14	420	9.4	240	5.8	3,7	2.6
15	390	9.4	240	5.6	3,5	3.5
16	380	9.3	250	5.4	3,3	2.6
17	(390)	9.2	260	4.7	3,0	3.0
18	270	9.2	---	---	2,4	3.3
19	280	9.2			1,4	2.8
20	300	9.2				3.4
21	300	8.9				2.5
22	300	8.6				2.9
23	300	8.2				2.4

Time: 172.5°E.

Sweep: 1.0 Mc to 13.0 Mc.

Table 25  
Wakkanai, Japan (45.4°N, 141.7°E)

Time	October 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	320	5.0			2.5	2.5
01	320	4.8			1.9	2.5
02	310	4.7			2.0	2.5
03	310	4.8			2.2	2.5
04	300	4.6			2.2	2.5
05	300	4.7	---	---	E	2.0
06	280	6.5	260	---	100	1.5
07	250	9.8	---	---	100	2.3
08	230	11.5	---	---	100	2.8
09	220	12.0	---	---	100	3.1
10	240	12.6	---	---	100	3.4
11	260	13.0	220	---	100	3.4
12	240	12.7	---	---	100	3.4
13	250	12.0	---	---	100	3.3
14	260	12.1	---	---	100	2.8
15	250	11.8	---	---	100	2.7
16	240	11.0	---	---	100	2.5
17	230	9.6	---	---	100	2.2
18	230	8.6	---	---	---	2.8
19	250	7.2				2.9
20	270	6.6				2.8
21	280	6.3				2.7
22	300	5.5				2.4
23	300	5.0				2.6

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 27  
Tokyo, Japan (35.7°N, 139.5°E)

Time	October 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	290	5.7			2.8	2.6
01	280	5.6			2.8	2.8
02	270	5.3			2.8	2.8
03	260	5.3			2.5	2.8
04	240	4.7			2.2	2.8
05	260	4.6	---	---	E	2.0
06	220	7.3	---	---	100	1.8
07	210	10.6	---	---	100	2.5
08	210	12.0	220	---	100	3.0
09	210	12.5	220	---	100	3.3
10	220	13.6	200	---	100	3.4
11	220	13.7	210	---	100	3.4
12	230	13.5	210	---	100	3.7
13	240	13.6	210	---	100	3.5
14	230	13.2	220	---	100	3.4
15	230	12.8	220	---	100	3.0
16	220	12.1	---	---	100	2.8
17	210	11.1	---	---	100	---
18	210	9.1	---	---	---	3.1
19	220	7.8				3.0
20	230	7.1				3.0
21	240	6.7				3.3
22	250	6.0				3.0
23	270	5.8				2.8

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 29  
Barotonga I. (21.3°S, 159.8°W)

Time	October 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	280	11.9			2.1	2.7
01	270	11.1			2.1	2.8
02	270	9.7			2.8	
03	280	10.6			2.8	
04	300	8.9			2.7	
05	300	9.2			2.8	
06	270	10.4	---	---	---	2.8
07	250	12.7	---	---	110	2.9
08	250	13.0	240	---	110	3.3
09	250	13.4	240	6.5	110	3.5
10	300	14.0	240	7.8	110	3.8
11	340	14.1	240	7.3	110	3.9
12	370	14.2	240	7.4	110	3.9
13	340	13.2	250	7.2	110	3.9
14	350	14.7	250	7.0	110	3.8
15	350	14.2	250	6.7	110	3.6
16	330	14.0	250	6.4	110	3.3
17	300	13.7	250	---	110	2.8
18	290	12.8	260	---	E	4.2
19	280	13.0				2.8
20	300	13.2				3.1
21	290	12.3				2.9
22	290	12.2				2.5
23	290	11.5				2.8

Time: 137.5°W.

Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 26

Time	October 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	300	5.6				2.0
01	300	5.6				2.2
02	300	5.2				2.0
03	300	5.1				2.6
04	290	4.9				1.9
05	280	5.2				2.7
06	250	7.2	---	---	120	1.9
07	230	10.0	---	---	110	2.4
08	220	10.7	220	---	110	2.9
09	230	11.0	---	---	110	
10	240	(11.3)	---	---	110	
11	250	(11.9)	---	---	110	
12	250	(11.6)	---	---	110	
13	250	(12.0)	---	---	110	
14	250	12.2	---	---	110	
15	250	11.8	---	---	110	
16	240	11.2	---	---	110	
17	230	10.2	---	---	110	
18	240	9.2	---	---	110	
19	240	7.4				
20	260	6.8				
21	270	6.0				
22	290	5.7				
23	300	5.5				

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 28

Time	October 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	280	6.6				2.2
01	290	6.6				1.7
02	270	6.2				2.9
03	38	5.6				2.9
04	280	5.2				2.8
05	290	4.8				2.7
06	290	4.9	---	---	E	2.2
07	240	8.7	---	---	110	2.2
08	240	11.2	230	---	110	2.8
09	240	11.8	230	---	110	3.4
10	260	13.5	220	---	110	3.4
11	260	14.0	230	---	110	3.6
12	270	14.3	230	---	110	3.6
13	280	14.4	230	---	110	3.6
14	280	14.4	240	---	110	3.4
15	270	14.3	240	---	120	3.3
16	260	13.8	250	---	110	3.0
17	250	13.6	230	---	110	2.5
18	240	12.2	230	---	110	3.8
19	230	10.8				3.0
20	250	9.4				3.0
21	260	9.2				3.4
22	250	8.3				3.2
23	270	7.6				2.8

Time: 135.0°E.

Sweep: 1.2 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 30

Time	September 1949					
	h'F2	f0F2	h'F1	f0F1	h'E	f0E
00	300	6.0				2.0
01	300	5.9				2.1
02	300	5.7				2.7
03	310	5.4				2.7
04	310	5.1				1.8
05	270	4.8				2.8
06	250	6.0	---	---	E	2.2
07	240	7.0	240	---	115	2.5
08	250	7.8	230	---	110	2.9
09	265	8.8	230	(4.8)	110	3.7
10	305	10.0	220	5.2	110	3.1
11	280	10.6	225	5.3	110	3.4
12	280	10.4	225	5.4	110	3.5
13	300	10.0	230	5.4	110	3.6
14	300	9.9	230	5.2	110	3.5
15	260	10.0	235	---	110	(3.2)
16	245	9.9	240	---	110	3.0
17	245	10.3	250	---	115	3.4
18	250	10.2	---	---	130	3.1
19	240	(8.8)	---	---	130	3.0
20	240	8.1				3.1
21	240	7.2				2.2
22	250	6.2				2.2
23	290	6.1				2.7

Time: Local.

Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

Table 31

Dakar, French West Africa (14.6°N, 17.4°W)							September 1949	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	300	---						
01	270	---						
02	250	(8.6)						
03	250	7.6						
04	250	6.8						
05	250	5.5						
06	260	7.4						
07	250	9.8	---	---	125	2.8	3.1	
08	250	10.4	240	---	120	3.3		
09	290	12.6	235	---	120	3.8		
10	325	13.6	235	---	115	---		
11	345	(14.0)	---	---	120	---		
12	365	(14.8)	---	---	115	---		
13	400	(15.6)	---	---	120	---		
14	370	16.4	230	---	115	4.0		
15	370	16.4	250	---	110	3.7		
16	345	16.4	250	---	115	3.2	3.7	
17	270	(16.0)	275	---	120	2.6	4.0	
18	290	(14.6)	---	---			3.9	
19	375	(14.0)					3.1	
20	380	13.8						
21	360	(10.0)						
22	370	(> 9.8)						
23	330	---						

Time: Local.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 33

Dakar, French West Africa (14.6°N, 17.4°W)							August 1949	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	340	(6.1)					3.6	
01	310	5.9					3.3	
02	300	6.0					3.2	
03	270	5.5					3.7	
04	280	5.0					2.3	
05	260	4.3						
06	250	6.2						
07	240	8.0	---	---	115	2.9	4.0	
08	255	8.6	230	---	115	3.4	4.0	
09	326	9.6	225	---	115	3.8		
10	370	10.8	215	5.4	120	3.8		
11	380	11.7	220	5.4	110	4.0		
12	400	(>12.6)	210	5.4	115	4.1		
13	410	(>13.6)	215	5.5	115	4.1		
14	380	(>14.0)	220	5.5	115	4.0		
15	370	(>14.0)	240	5.2	120	3.6		
16	340	(>14.0)	240	5.0	120	3.3		
17	300	(>14.0)	250	---	120	2.8	3.8	
18	280	(12.2)	255	---	150	2.3	3.6	
19	330	11.0						
20	410	10.4						
21	405	8.6						
22	390	7.9					3.0	
23	380	6.6					3.3	

Time: Local.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 35

Dakar, French West Africa (14.6°N, 17.4°W)							July 1949	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	370	(4.9)						
01	340	(5.4)						
02	320	(6.5)						
03	320	(6.2)					3.9	
04	300	(5.5)					3.2	
05	280	4.8					3.8	
06	250	6.4					4.5	
07	240	7.7	---	---	120	---	4.6	
08	250	8.1	220	---	120	(3.3)	6.0	
09	330	(>9.0)	230	---	120	3.6	4.4	
10	(320)	10.0	225	---	110	---	4.8	
11	380	11.2	220	5.6	120	4.2		
12	400	12.0	220	6.5	110	---	4.3	
13	420	11.9	215	5.6	120	4.0	4.3	
14	400	12.4	220	5.4	115	4.0	4.2	
15	370	13.4	230	(5.2)	120	3.6		
16	355	13.4	230	---	120	3.3	4.3	
17	320	12.6	235	---	120	3.0	4.1	
18	275	(11.4)	280	---	120	---	4.4	
19	300	(11.0)					4.0	
20	380	(9.0)					3.8	
21	410	7.4						
22	420	6.6					3.0	
23	400	(5.1)					3.9	

Time: Local.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 32

Fribourg, Germany (48.1°N, 7.8°E)							August 1949	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	300	6.0						3.1
01	290	5.8						2.5
02	295	5.3						2.6
03	280	5.2						2.5
04	280	4.8	---	---	---	---		2.8
05	260	5.2	---	---	---	---		2.9
06	250	6.1	250	3.8	120	2.2	3.7	3.1
07	270	6.4	230	(4.1)	110	2.8	4.2	3.1
08	300	7.1	230	4.6	110	3.1	4.8	3.0
09	300	7.4	225	4.9	110	(3.5)	4.7	3.1
10	310	7.5	220	5.2	110	3.6	5.3	3.0
11	320	7.9	215	5.3	110	3.7	4.5	2.9
12	340	7.9	220	5.1	110	3.7	5.1	2.9
13	350	7.9	225	5.1	110	3.8	4.6	2.9
14	325	8.2	230	5.1	110	3.7	4.5	2.9
15	325	7.9	225	4.9	110	(3.5)	4.2	2.9
16	315	8.0	230	4.5	110	3.3	4.4	2.9
17	290	8.1	240	4.2	110	2.9	4.0	3.0
18	270	8.3	250	---	120	2.4	4.1	3.0
19	255	8.6	---	---	---		3.9	3.1
20	240	8.0					3.7	3.0
21	250	7.4					3.6	2.9
22	260	6.4					3.2	2.8
23	255	6.2					3.2	2.7

Time: Local.

Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

Table 34

Fribourg, Germany (48.1°N, 7.8°E)							July 1949	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	275	7.2						3.0
01	280	6.9						2.7
02	275	6.4						2.5
03	280	6.2						2.8
04	280	6.0	---	---	---	---		2.8
05	280	6.6	250	(3.5)	125	1.8	3.6	2.9
06	280	7.3	240	4.2	110	2.5	4.0	3.0
07	300	7.4	230	4.6	110	3.0	4.4	3.0
08	305	7.6	230	4.8	105	3.3	4.7	(2.9)
09	330	7.6	210	5.1	105	3.5	5.1	2.9
10	320	8.0	215	5.3	105	3.6	4.5	2.9
11	330	7.9	210	5.4	105	3.7	5.6	2.8
12	340	8.0	215	5.3	105	3.8	5.7	2.9
13	345	7.8	220	5.4	105	3.8	5.5	2.9
14	345	7.6	210	5.3	105	3.8	4.5	2.8
15	350	7.4	215	5.1	105	3.6	4.5	2.9
16	330	7.5	225	5.0	110	3.4	4.4	2.8
17	315	7.5	235	4.6	105	3.0	4.4	2.9
18	290	7.7	240	4.2	110	2.6	4.1	3.0
19	275	8.7	250	3.5	120	2.1	3.7	(2.9)
20	260	7.8						3.9
21	260	7.6						3.4
22	270	7.6						3.4
23	280	7.4						3.2

Time: Local.

Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

**TABLE 36**  
**IONOSPHERIC DATA**

**h<sup>F2</sup>, Km**    **Km**    **March**, 1950  
 (Characteristic)    (Unit)    (Month)

Observed at **Washington, D.C.**

Lat. **38°7'N**, Long. **77°1'W**

Day	75°W												Mean Time															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	2.180	2.70	2.70	2.60	2.80	(3.00) <sup>S</sup>	[2.70] <sup>S</sup>	2.40	2.30	2.10	2.00 <sup>H</sup>	2.20	2.00 <sup>H</sup>	M	M	2.30	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10				
2	(2.170) <sup>S</sup>	2.80	2.80	2.70	2.70	(2.60) <sup>S</sup>	(3.00) <sup>S</sup>	2.50	2.30	2.10	2.00 <sup>H</sup>	2.20	2.00 <sup>H</sup>	2.20	2.10	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20				
3	2.250	2.90	2.90	2.90	2.80	2.60	2.20	2.30	2.10	2.00 <sup>H</sup>	2.60	2.20	2.20	2.10	2.60	2.50	2.45	2.30	2.20	(2.30) <sup>S</sup>	(2.50) <sup>S</sup>	(2.40) <sup>S</sup>	(2.40) <sup>S</sup>					
4	(2.250) <sup>S</sup>	(2.60) <sup>S</sup>	2.50	2.50	2.50	2.30	2.20	2.20	2.10	2.40 <sup>H</sup>	2.50	2.30	2.30	2.20	2.20	2.20	2.20	2.20	2.20	2.20								
5	(2.260) <sup>S</sup>	(2.60) <sup>S</sup>	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80								
6	(2.250) <sup>S</sup>	2.90	(2.80) <sup>S</sup>	2.70	2.50	(2.60) <sup>S</sup>	(2.50) <sup>S</sup>	2.50	2.40	2.30	2.70	2.80	2.70	2.90	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70			
7	(2.260) <sup>S</sup>	2.60	3.00	3.00	(3.40) <sup>S</sup>	(3.30) <sup>S</sup>	(2.90) <sup>S</sup>	2.60 <sup>H</sup>	2.50 <sup>H</sup>	3.20 <sup>H</sup>	3.40 <sup>H</sup>	3.30 <sup>H</sup>	3.10 <sup>A</sup>	2.90 <sup>K</sup>	2.80 <sup>A</sup>	2.90 <sup>H</sup>	2.90 <sup>A</sup>	C	C	C	C	C	C	C	C			
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
9	2.80	2.80	2.70	2.50	2.60	2.60	2.90	2.90	2.30	2.20	2.40	2.40	2.10	2.00 <sup>H</sup>	2.00	2.80	2.70	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30			
10	2.80	2.80	2.80	2.90	2.70	2.70	2.40	2.30	2.30	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40			
11	2.70	2.70	2.70	2.60	2.60	2.60	2.70	2.70	2.30	2.30	2.30	2.30	2.20	2.20	(2.50) <sup>S</sup>	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30			
12	2.90	2.70	2.90	2.50	2.30	2.70	2.70	2.40	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30			
13	2.70	2.80	2.80	2.60	2.60	2.50	2.50	2.40	2.20	2.40	2.40	2.00 <sup>H</sup>	2.00 <sup>H</sup>	2.00 <sup>H</sup>	2.00 <sup>H</sup>	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00			
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
16	(3.00) <sup>S</sup>	(3.10) <sup>S</sup>	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00			
17	2.80	2.90	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00			
18	2.80	3.00	3.00	3.10	3.00	2.90	2.90	2.50	2.80	2.80	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90			
19	2.90	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
20	(3.00) <sup>S</sup>	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	G	K	C	K	C				
21	3.00	3.10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
22	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>				
23	(2.270) <sup>S</sup>	(4.60) <sup>S</sup>	2.80	2.90	2.70	2.80	2.50	2.30 <sup>H</sup>	1.70	1.70	1.70	1.70	1.70	1.70	M	M	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70			
24	(3.30) <sup>S</sup>	(3.00) <sup>S</sup>	3.00	3.40	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70			
25	3.00 <sup>K</sup>	[3.50] <sup>S</sup>	[4.00] <sup>S</sup>	(3.70) <sup>S</sup>																								
26	(3.00) <sup>S</sup>	3.00	2.80	2.70	2.70	2.60	2.60	2.50	2.30	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70		
27	(3.00) <sup>S</sup>	(3.30) <sup>S</sup>	(3.00) <sup>S</sup>	2.90	2.50	3.00	2.70	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00		
28	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>	(3.00) <sup>S</sup>				
29	3.00	3.00	2.90	2.80	2.90	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80		
30	(2.90) <sup>S</sup>	3.00	3.00	3.00	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90		
31	3.00	3.00	2.90	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00		
Median	2.90	2.90	2.90	2.80	2.80	2.80	2.80	2.80	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70		
Count	28	2.6	2.5	2.6	2.4	2.7	2.8	2.8	2.7	2.9	2.8	2.7	2.8	2.7	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9

National Bureau of Standards

Scaled by: B.E.B., J.S.,

(Institution)

Calculated by:

By H - J.S.,

7.0

Sweep 1.0

Mc 1.25.0

Mc 1.05 min

Automatic

Manual

□

\* DATA FROM STERLING FIELD STATION

□ TIME OF OBSERVATION DOUBTFUL

3.00

2.90

2.80

2.70

2.60

2.50

2.40

2.30

2.20

2.10

2.00

1.90

1.80

1.70

1.60

1.50

1.40

1.30

1.20

1.10

1.00

0.90

0.80

0.70

0.60

0.50

0.40

0.30

0.20

0.10

0.00

-0.10

-0.20

-0.30

-0.40

-0.50

-0.60

-0.70

-0.80

-0.90

-1.00

-1.10

-1.20

-1.30

-1.40

-1.50

-1.60

-1.70

-1.80

-1.90

-2.00

-2.10

-2.20

-2.30

-2.40

-2.50

-2.60

-2.70

-2.80

-2.90

-3.00

-3.10

-3.20

-3.30

-3.40

-3.50

-3.60

-3.70

-3.80

-3.90

-4.00

-4.10

-4.20

-4.30

-4.40

-4.50

-4.60

-4.70

-4.80

-4.90

-5.00

-5.10

-5.20

TABLE 37  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
IONOSPHERIC DATA

Form adopted June 1946  
National Bureau of Standards  
Scoled by: B.E.B., J.S. (Institution)  
Calculated by: By H.-J.W.

foF2      Mc      March, 1950  
(Characteristic)      (Unit)      (Month)

Observed at: Washington, D.C.

Lat. 38°7'N, Long. 77°10'W

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	5.7	(5.5) <sup>S</sup>	5.2	4.9	(4.1) <sup>S</sup>	(3.9) <sup>S</sup>	3.4 <sup>F</sup>	5.4	7.2	(8.8) <sup>S</sup>	(9.2) <sup>S</sup>	9.9	10.5	(10.4) <sup>S</sup>	M	M	10.7	9.7	(10.8) <sup>S</sup>	(7.7) <sup>S</sup>	(6.8) <sup>S</sup>	5.3	5.2			
2	4.9	4.8	(4.5) <sup>S</sup>	(4.0) <sup>S</sup>	3.6	(3.7)	(5.9) <sup>S</sup>	8.2	(8.7) <sup>S</sup>	10.0	9.5	10.9	10.9	10.7	9.3	8.8	6.3	(6.0) <sup>S</sup>	5.6	(5.5) <sup>S</sup>						
3	4.8	(4.2) <sup>J</sup>	(3.9) <sup>S</sup>	3.9	(4.0) <sup>S</sup>	3.8	3.7	6.0	(8.1) <sup>S</sup>	8.7	9.2	10.6	11.0	10.8	11.2	10.0	9.6	8.1	(6.1) <sup>S</sup>	(6.0) <sup>S</sup>	(6.1) <sup>S</sup>	(5.9) <sup>S</sup>				
4	5.3	4.8	4.4 <sup>J</sup>	4.2	(4.0) <sup>S</sup>	3.5	(3.2)	5.8	7.5	8.4	9.5	(10.6) <sup>S</sup>	11.4	11.4	10.5	10.5	10.0	9.4	8.3	7.3	6.4	5.8	5.6			
5	5.1	4.9	4.7	4.8	(4.1) <sup>S</sup>	3.5	6.3	8.0	8.6	(9.2) <sup>P</sup>	9.3	10.3	10.4	10.4	10.0	9.8	(9.5) <sup>S</sup>	8.9	8.1	7.5	7.2	6.6	5.9			
6	5.6	5.7	5.6	5.4 <sup>J</sup>	4.8	4.4 <sup>J</sup>	(4.6) <sup>S</sup>	5.8	7.3	8.4	9.4	10.4	10.5	10.6	10.6	10.3	9.7	9.2	8.3	8.5	7.5	7.0	6.7			
7	6.1	5.8	5.4	F	(4.6) <sup>S</sup>	3.9	X(4.2) <sup>S</sup>	3.9	4.9 <sup>F</sup>	5.8	6.5 <sup>X</sup>	7.0 <sup>X</sup>	7.8 <sup>X</sup>	8.4 <sup>X</sup>	8.8 <sup>X</sup>	9.0 <sup>X</sup>	9.0 <sup>X</sup>	9.7 <sup>X</sup>	C	C	C	C	C			
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
9	6.4	(6.1) <sup>S</sup>	(6.0) <sup>S</sup>	4.9 <sup>F</sup>	4.3	(4.0) <sup>S</sup>	4.0	6.2	(8.1) <sup>S</sup>	9.7	10.4	10.7	11.1	11.5	(11.7) <sup>S</sup>	11.8	11.2	10.6	10.0	(8.9) <sup>S</sup>	(7.7) <sup>S</sup>	6.6	6.8	6.4		
10	6.3	(6.0) <sup>J</sup>	5.5	5.2 <sup>F</sup>	5.3 <sup>F</sup>	4.7 <sup>F</sup>	3.9 <sup>F</sup>	6.6	8.5	(9.7) <sup>S</sup>	11.1	(12.0) <sup>S</sup>	11.8	(11.4) <sup>S</sup>	10.8	(10.5) <sup>S</sup>	10.5	(10.9) <sup>S</sup>	8.1	7.2	(6.7) <sup>S</sup>	6.4	6.0			
11	6.0	(5.8) <sup>J</sup>	5.8 <sup>S</sup>	5.3 <sup>F</sup>	5.2 <sup>F</sup>	4.9 <sup>F</sup>	4.3 <sup>F</sup>	6.7	8.1	9.6	10.6	10.2	11.0	11.1	10.9	10.4	10.6	10.0	9.0	8.1	7.2	6.9	6.3			
12	(6.1) <sup>J</sup>	6.0 <sup>F</sup>	(5.9) <sup>J</sup>	5.7 <sup>F</sup>	4.9 <sup>F</sup>	4.0 <sup>F</sup>	(4.6) <sup>J</sup>	7.0 <sup>F</sup>	9.1	10.3	10.7	10.9	11.1	11.2	11.5	11.3	11.0	(10.8) <sup>S</sup>	9.5	8.4	7.6	6.9				
13	6.4	6.0	5.6	5.2	4.9	4.5	4.9	7.2	9.5	9.7	11.0	11.5	11.2	11.4	11.5	11.6	11.4	11.4	(10.7) <sup>S</sup>	9.6 <sup>S</sup>	9.0	(8.0) <sup>S</sup>	7.5	6.7		
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
16	5.3	(5.3) <sup>S</sup>	(5.2) <sup>S</sup>	4.6	4.7	5.0 <sup>F</sup>	6.9 <sup>F</sup>	8.4	9.4	10.0	10.7	10.8	10.7	10.8	10.6	10.3	9.7	9.7	(9.1) <sup>S</sup>	8.4	7.7	6.8	(6.1) <sup>S</sup>	5.7		
17	(5.4) <sup>S</sup>	(5.1) <sup>J</sup>	(5.1) <sup>S</sup>	F(4.8) <sup>F</sup>	4.6 <sup>F</sup>	(4.3) <sup>S</sup>	4.5 <sup>F</sup>	6.6 <sup>F</sup>	8.0 <sup>F</sup>	8.5	9.7	9.5	9.7 <sup>F</sup>	[9.8] <sup>T</sup>	9.8	9.6	9.7	9.9	9.3 <sup>F</sup>	(8.1) <sup>S</sup>	(7.0) <sup>S</sup>	(6.2) <sup>S</sup>	(5.8) <sup>S</sup>			
18	(5.8) <sup>S</sup>	(5.1) <sup>J</sup>	5.2 <sup>F</sup>	5.0 <sup>F</sup>	4.6 <sup>F</sup>	(4.4) <sup>J</sup>	4.9 <sup>F</sup>	6.2 <sup>F</sup>	(8.1) <sup>S</sup>	8.6 <sup>F</sup>	9.1	10.0	10.5	(10.4) <sup>J</sup>	10.2	10.3	10.4	(10.6) <sup>S</sup>	(8.5) <sup>S</sup>	7.7 <sup>F</sup>	7.0 <sup>F</sup>	(6.2) <sup>S</sup>	(6.0) <sup>S</sup>			
19	(6.2) <sup>J</sup>	(6.0) <sup>C</sup>	(5.2) <sup>C</sup>	3.5 <sup>X</sup>	(2.9) <sup>F</sup>	(2.9) <sup>F</sup>	(2.9) <sup>F</sup>	3.2 <sup>X</sup>	C	C	C	C	C	C	C	C	C	5.0 <sup>K</sup>	4.4 <sup>K</sup>	(4.0) <sup>S</sup>	(4.0) <sup>S</sup>	(3.7) <sup>S</sup>	(3.3) <sup>K</sup>			
20	3.1 <sup>J</sup>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	5.0 <sup>K</sup>	4.4 <sup>K</sup>	(4.0) <sup>S</sup>	(4.0) <sup>S</sup>	(3.7) <sup>S</sup>	(3.3) <sup>K</sup>			
21	(5.7) <sup>J</sup>	(5.0) <sup>J</sup>	(4.8) <sup>J</sup>	(5.6) <sup>J</sup>	(4.9) <sup>J</sup>	3.0	(3.9) <sup>S</sup>	6.9 <sup>F</sup>	9.7	10.2	10.8	11.4	11.6	11.4	(10.7) <sup>S</sup>	10.6	(10.3) <sup>S</sup>	(9.3) <sup>S</sup>	(8.0) <sup>S</sup>	(7.0) <sup>S</sup>	(6.2) <sup>S</sup>	(5.7) <sup>S</sup>				
22	(5.3) <sup>J</sup>	(3.6) <sup>J</sup>	(3.6) <sup>J</sup>	(4.6) <sup>S</sup>	(4.3) <sup>S</sup>	[4.0] <sup>J</sup>	(3.7) <sup>S</sup>	(3.7) <sup>S</sup>	(7.1) <sup>S</sup>	11.9	(10.8) <sup>S</sup>	11.9	12.0	11.7	[11.7] <sup>M</sup>	11.2	11.5	(11.7) <sup>S</sup>	(10.7) <sup>S</sup>	9.3	(8.4) <sup>S</sup>	(8.0) <sup>S</sup>	(7.6) <sup>S</sup>			
23	(6.4) <sup>S</sup>	(5.5) <sup>J</sup>	(4.9) <sup>J</sup>	(4.4) <sup>S</sup>	(3.9) <sup>S</sup>	(3.9) <sup>J</sup>	(3.7) <sup>S</sup>	(3.7) <sup>S</sup>	(3.7) <sup>S</sup>	9.2	(10.8) <sup>S</sup>	11.9	12.4	12.0	11.7	11.7	11.5	(11.7) <sup>S</sup>	(11.7) <sup>S</sup>	9.3	(8.4) <sup>S</sup>	(8.0) <sup>S</sup>	(7.6) <sup>S</sup>			
24	(5.9) <sup>J</sup>	(5.4) <sup>J</sup>	(4.4) <sup>J</sup>	(3.7) <sup>J</sup>	(3.2) <sup>J</sup>	(2.8) <sup>J</sup>	(2.8) <sup>J</sup>	(2.8) <sup>J</sup>	(2.8) <sup>J</sup>	6.7	(7.3) <sup>T</sup>	7.9	8.5	8.7	9.1	9.4	9.5	9.7	(9.6) <sup>S</sup>	(9.1) <sup>S</sup>	(8.4) <sup>S</sup>	(7.4) <sup>S</sup>	(6.0) <sup>S</sup>			
25	(3.6) <sup>J</sup>	3.0 <sup>J</sup>	F(2.9) <sup>J</sup>	(3.0) <sup>J</sup>	(2.8) <sup>J</sup>	(2.5) <sup>J</sup>	(2.5) <sup>J</sup>	(2.5) <sup>J</sup>	(2.5) <sup>J</sup>	9.7	10.2	10.8	11.4	11.6	11.4	11.4	11.4	(10.7) <sup>S</sup>	10.6	(10.3) <sup>S</sup>	(9.3) <sup>S</sup>	(8.0) <sup>S</sup>	(7.0) <sup>S</sup>			
26	(4.7) <sup>J</sup>	4.5	(4.3) <sup>J</sup>	(3.7) <sup>J</sup>	3.6	3.2	(4.3) <sup>S</sup>	6.3 <sup>V</sup>	7.8	8.6	8.1	8.4 <sup>Z</sup>	8.6	9.2	9.3	9.3	9.3	(9.3) <sup>S</sup>	(8.7) <sup>S</sup>	(8.0) <sup>S</sup>	(7.4) <sup>S</sup>	(6.7) <sup>S</sup>	(6.0) <sup>S</sup>			
27	(5.6) <sup>J</sup>	5.0	(5.3) <sup>J</sup>	(5.0) <sup>S</sup>	(4.2) <sup>J</sup>	3.5	4.0	5.3	6.7	6.8	7.5 <sup>V</sup>	8.5	9.0	(9.2) <sup>Z</sup>	9.5	9.6	9.3	9.7	(9.1) <sup>S</sup>	(9.2) <sup>S</sup>	(8.6) <sup>S</sup>	(7.6) <sup>S</sup>	(6.3) <sup>S</sup>	(5.9) <sup>S</sup>		
28	(5.6) <sup>J</sup>	(5.0) <sup>J</sup>	(4.7) <sup>J</sup>	(4.7) <sup>J</sup>	(4.5) <sup>J</sup>	(4.5) <sup>J</sup>	(4.5) <sup>J</sup>	(4.5) <sup>J</sup>	(4.5) <sup>J</sup>	9.2	10.5	(10.4) <sup>J</sup>	10.4	10.4	10.4	10.3	10.0	(10.2) <sup>S</sup>	(9.8) <sup>S</sup>	(9.8) <sup>S</sup>	(8.8) <sup>S</sup>	(7.6) <sup>S</sup>	(6.0) <sup>S</sup>			
29	(5.8) <sup>J</sup>	(5.5) <sup>J</sup>	(5.4) <sup>J</sup>	(4.9) <sup>J</sup>	4.9 <sup>F</sup>	3.7 <sup>F</sup>	(4.3) <sup>J</sup>	(5.7) <sup>J</sup>	8.0	8.8	10.0	10.4	10.6	10.6	[11.1] <sup>M</sup>	11.0	10.6	(10.3) <sup>S</sup>	10.1	(9.2) <sup>S</sup>	(7.9) <sup>S</sup>	(7.6) <sup>S</sup>	6.7	6.1		
30	(6.0) <sup>J</sup>	(5.9) <sup>J</sup>	(5.2) <sup>J</sup>	(4.7) <sup>J</sup>	(4.7) <sup>J</sup>	(4.0) <sup>J</sup>	(4.0) <sup>J</sup>	(4.0) <sup>J</sup>	(4.0) <sup>J</sup>	6.6 <sup>F</sup>	5.9 <sup>F</sup>	6.6 <sup>F</sup>	7.3	7.5	8.7	9.4	9.8	9.7	9.6	(9.7) <sup>S</sup>	(9.0) <sup>S</sup>	(7.3) <sup>S</sup>	(7.0) <sup>S</sup>	(6.0) <sup>S</sup>	(5.8) <sup>S</sup>	
31	5.8 <sup>F</sup>	5.4 <sup>F</sup>	5.2 <sup>F</sup>	4.5 <sup>F</sup>	4.2 <sup>F</sup>	4.6 <sup>F</sup>	4.8 <sup>F</sup>	6.5 <sup>F</sup>	6.9 <sup>Z</sup>	8.0 <sup>F</sup>	8.9	9.2	9.4	10.0	10.5	10.5	10.0	9.6	10.0	9.0	8.8	7.8	(7.3) <sup>S</sup>	6.2 <sup>F</sup>		
Median	5.7	(5.4)	(5.2)	4.8	4.2	4.0	4.0	4.1	7.9	8.7	9.4	10.1	10.5	10.6	10.5	10.2	9.9	9.9	(9.5)	(8.6)	(7.6)	(7.0)	6.2	5.9		
Count	29	27	27	27	27	28	28	28	28	27	27	28	28	28	28	29	30	30	30	30	30	30	30	29	24	

\* DATA FROM STERLING FIELD STATION  
□ TIME OF OBSERVATION DOUBTFUL

Sweep 1.0 Mc to 25.0 Mc in 0.5 min

Manual □ Automatic

TABLE 38  
 National Bureau of Standards  
 (Institution)

Scaled by: B. E. B. J. S.

 IONOSPHERIC DATA  
 Washington, D. C.

 $f_{0F2}$ , Mc  
 (Characteristic)  
 March,  
 (Month)  
 1950

Observed at Lat. 38.7°N., Long. 77.1°W.

Day	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	Calculated by: B. E. B. J. S.					
1	(5.7) <sup>s</sup>	(5.3) <sup>s</sup>	(5.1) <sup>s</sup>	(4.4) <sup>s</sup>	(3.9) <sup>s</sup>	3.6	4.7	7.2	(8.7) <sup>s</sup>	9.0	10.0	10.0	11.1	10.8	11	10.8	11.1	10.5	(9.5) <sup>s</sup>	9.1	[7.8] <sup>s</sup>	C	C	C	(5.7) <sup>s</sup>	(5.3) <sup>s</sup>	5.0		
2	4.8	4.8	4.7	(4.2) <sup>s</sup>	3.9	3.6	4.7	7.2	(8.7) <sup>s</sup>	8.8	(9.2) <sup>s</sup>	(10.0) <sup>s</sup>	10.6	11.1	10.7	11.0	10.6	10.7	11.2	10.8	10.1	10.0	10.1	10.1	10.0	10.0	10.0		
3	(4.4) <sup>s</sup>	(4.0) <sup>s</sup>	(3.9) <sup>s</sup>	(3.9) <sup>s</sup>	(3.9) <sup>s</sup>	3.6	4.7	7.1	8.8	8.8	10.8	10.7	11.2	11.2	10.8	10.4	10.1	10.1	(9.9) <sup>s</sup>	8.7	[9.8] <sup>s</sup>	(5.7) <sup>s</sup>	(5.5) <sup>s</sup>	(5.5) <sup>s</sup>	(5.5) <sup>s</sup>	(5.5) <sup>s</sup>	(5.5) <sup>s</sup>		
4	4.9	4.6	4.2	(4.0) <sup>s</sup>	3.7	3.2	4.5	(6.8) <sup>s</sup>	7.9	8.5	(8.8) <sup>s</sup>	9.3	9.3	10.0	10.2	10.4	10.0	10.0	10.0	(9.9) <sup>s</sup>	8.7	[9.8] <sup>s</sup>	(5.7) <sup>s</sup>	(5.9) <sup>s</sup>	5.9	4.5	5.2	5.2	
5	5.0	5.1	4.8	4.7	3.6	3.4	4.6	7.4	8.5	9.3	9.3	10.0	10.0	10.2	10.4	10.0	10.0	10.0	(9.9) <sup>s</sup>	7.8	[9.8] <sup>s</sup>	(5.7) <sup>s</sup>	(6.1) <sup>s</sup>	5.8	5.8	5.8	5.8		
6	(5.5) <sup>s</sup>	5.7	5.5	5.2	4.5	4.5	(4.4) <sup>s</sup>	4.7	6.7	7.9	9.0	10.1	10.2	10.6	10.5	10.8	10.4	10.8	(9.6) <sup>s</sup>	(9.9) <sup>s</sup>	[8.7] <sup>s</sup>	(8.7) <sup>s</sup>	7.3	7.0	6.5	6.5	6.5	6.5	
7	5.9	5.7	(5.3) <sup>s</sup>	3.9	F(3.9) <sup>s</sup>	K(3.9) <sup>s</sup>	K(4.3) <sup>s</sup>	5.5	6.0	K(7.1) <sup>s</sup>	6.8	K(7.1) <sup>s</sup>	8.4	K	9.3	K	9.2	K	(9.3) <sup>s</sup>	(9.7) <sup>s</sup>	C	C	C	C	C	C	C	C	
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
9	6.3	(6.0) <sup>s</sup>	(5.8) <sup>s</sup>	4.7	F(4.7) <sup>s</sup>	4.0	(3.9) <sup>s</sup>	5.2	7.7	(9.0) <sup>s</sup>	10.1	10.6	11.2	11.5	11.7	[11.8] <sup>s</sup>	11.3	11.0	(10.3) <sup>s</sup>	(9.4) <sup>s</sup>	(8.4) <sup>s</sup>	(7.9) <sup>s</sup>	(7.9) <sup>s</sup>	(7.9) <sup>s</sup>	(7.9) <sup>s</sup>	(7.9) <sup>s</sup>	6.4		
10	(6.2) <sup>s</sup>	5.8	(5.4) <sup>F</sup>	[5.2] <sup>s</sup>	5.0	4.6	4.4	F	[5.2] <sup>s</sup>	5.3	7.4	8.8	9.8	10.6	11.4	11.3	11.7	11.4	10.9	10.9	10.6	10.4	9.2	7.5	(6.9) <sup>s</sup>	6.6	6.3	6.0	F
11	5.8	F	(5.6) <sup>s</sup>	(5.5) <sup>s</sup>	5.2	F	[5.0] <sup>s</sup>	(4.7) <sup>s</sup>	5.1	F	7.5	8.8	10.0	11.0	10.8	11.1	11.1	10.8	10.6	10.5	(10.5) <sup>s</sup>	(9.7) <sup>s</sup>	8.5	7.6	7.2	6.9	F	6.4	F
12	(6.4) <sup>s</sup>	5.8	F	5.8	F	5.2	F	4.3	F	3.8	F	10.0	10.5	11.3	11.1	11.2	11.3	11.3	11.2	11.2	11.2	[10.8] <sup>s</sup>	(10.2) <sup>s</sup>	8.8	8.1	7.7	7.1	[6.4] <sup>s</sup>	[6.4] <sup>s</sup>
13	6.3	5.7	5.5	5.0	4.7	4.5	5.8	8.4	9.1	9.7	11.3	10.9	11.4	11.5	11.4	11.3	11.4	11.3	11.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7		
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
16	5.0	5.3	5.1	4.7	F	4.6	4.7	(6.1) <sup>s</sup>	8.0	8.5	V	9.6	10.8	11.2	13.6	13.9	10.7	10.4	(10.1) <sup>s</sup>	(9.9) <sup>s</sup>	9.9	9.7	(8.7) <sup>s</sup>	(7.7) <sup>s</sup>	(7.7) <sup>s</sup>	(7.7) <sup>s</sup>	(7.7) <sup>s</sup>	5.5	
17	5.3	(5.1) <sup>s</sup>	5.1	F	4.8	F	(4.5) <sup>s</sup>	4.7	F	(4.7) <sup>s</sup>	7.2	F	8.8	(8.9) <sup>s</sup>	9.4	9.8	[9.8] <sup>s</sup>	9.9	9.9	9.7	(10.4) <sup>s</sup>	(9.4) <sup>s</sup>	(8.8) <sup>s</sup>	(8.8) <sup>s</sup>	(8.8) <sup>s</sup>	(8.8) <sup>s</sup>	(8.8) <sup>s</sup>	(8.8) <sup>s</sup>	5.5
18	(5.5) <sup>s</sup>	(5.6) <sup>s</sup>	(5.4) <sup>s</sup>	4.7	F	4.5	F	4.7	F	(4.7) <sup>s</sup>	5.7	F	(5.5) <sup>s</sup>	7.8	8.8	(8.9) <sup>s</sup>	9.0	10.0	10.4	(10.2) <sup>s</sup>	10.4	10.3	(10.4) <sup>s</sup>	(10.4) <sup>s</sup>	(10.4) <sup>s</sup>	(10.4) <sup>s</sup>	(10.4) <sup>s</sup>	(10.4) <sup>s</sup>	5.5
19	(6.0) <sup>s</sup>	K(5.9) <sup>s</sup>	4.6	K	(2.8) <sup>s</sup>	(3.0) <sup>s</sup>	2.9	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C		
20	C	K	C	K	C	K	C	K	2.7	F	2.7	F	2.9	F	6.2	6.8	[7.4] <sup>s</sup>	8.1	2.5	(8.9) <sup>s</sup>	y.2	9.4	(9.7) <sup>s</sup>	(9.6) <sup>s</sup>	(9.5) <sup>s</sup>	(9.5) <sup>s</sup>	(9.5) <sup>s</sup>	(9.5) <sup>s</sup>	6.4
21	[5.4] <sup>c</sup>	(4.9) <sup>c</sup>	[5.2] <sup>c</sup>	(5.2) <sup>c</sup>	2.8	5.4	F	(4.0) <sup>s</sup>	7.0	F	8.7	F	8.7	F	10.3	11.4	11.7	11.6	11.3	10.6	(10.4) <sup>s</sup>	(10.3) <sup>s</sup>	(10.2) <sup>s</sup>	(8.7) <sup>s</sup>	(8.7) <sup>s</sup>	(8.7) <sup>s</sup>	(8.7) <sup>s</sup>	(8.7) <sup>s</sup>	5.5
22	(4.9) <sup>s</sup>	(4.9) <sup>s</sup>	(4.5) <sup>s</sup>	(4.7) <sup>s</sup>	(4.7) <sup>s</sup>	(4.8) <sup>s</sup>	(4.8) <sup>s</sup>	5.5																					
23	(5.9) <sup>s</sup>	(4.9) <sup>s</sup>	(4.6) <sup>s</sup>	(4.6) <sup>s</sup>	5.5																								
24	(5.6) <sup>s</sup>	(5.0) <sup>s</sup>	(4.0) <sup>s</sup>	(3.6) <sup>s</sup>	(3.6) <sup>s</sup>	5.5																							
25	3.4	K	(2.9) <sup>s</sup>	(2.9) <sup>s</sup>	(2.8) <sup>s</sup>	K(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	5.5			
26	4.6	4.2	(3.7) <sup>s</sup>	(3.7) <sup>s</sup>	5.5																								
27	(5.4) <sup>s</sup>	5.2	(5.1) <sup>s</sup>	(4.8) <sup>s</sup>	(4.8) <sup>s</sup>	5.5																							
28	□(5.2) <sup>s</sup>	□(5.0) <sup>s</sup>	□(4.8) <sup>s</sup>	□(4.6) <sup>s</sup>	□(4.2) <sup>s</sup>	□(4.2) <sup>s</sup>	□(4.2) <sup>s</sup>																						
29	F(5.7) <sup>s</sup>	5.7	F	5.3	F	4.1	F	(4.0) <sup>s</sup>	(3.7) <sup>s</sup>	5.2	6.9	8.4	7.6	10.2	10.3	10.7	11.2	11.2	10.8	10.5	(10.2) <sup>s</sup>	(9.7) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	5.5
30	(5.8) <sup>s</sup>	5.4	(5.4) <sup>s</sup>	4.9	F	4.5	F	(4.7) <sup>s</sup>	(3.9) <sup>s</sup>	5.2	6.7	8.4	7.6	10.2	10.3	10.7	11.2	11.2	10.8	10.5	(10.2) <sup>s</sup>	(9.7) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	(7.6) <sup>s</sup>	5.5
31	5.7	F	5.2	4.9	F	4.4	F	4.5	F	4.4	F	5.8	F	7.3	7.4	7.1	7.2	9.2	9.7	10.2	10.5	10.5	10.5	10.5	10.5	10.5	10.5	5.5	
Median	(5.5)	5.2	5.1	4.7	(4.0)	3.8	5.2	7.2	7.7	7.7	7.7	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2		
Count	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	

 \* DATA FROM STERLING FIELD STATION  
 □ TIME OF OBSERVATION DOUBTFUL

Sweep 1.0 Mc in 0.5 min

Manual □ Automatic

TABLE 39  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

$h'F_1$		Km (Characteristic)		March (Month)		1950		75°W		Mean Time															
Observed at Washington, D.C.		Lat 38.7°N		Long 77.1°W																					
Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
2									Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
3									Q	Q	Q	Q	200	Q	210	220	210	Q	Q	Q	Q	Q	Q	Q	
4									Q	Q	Q	Q	220	220	200	230	200	Q	Q	Q	Q	Q	Q	Q	
5									Q	Q	Q	Q	220	220	200	200	220	220	220	220	Q	Q	Q	Q	
6									Q	Q	Q	Q	200	200	200	200	220	220	220	220	220	Q	Q	Q	
7									Q	K	240	K	220	230	230	230	230	230	230	230	230	230	230	230	
8									Q	Q	210	210	210	210	210	210	210	210	210	210	210	210	210		
9									Q	Q	210	2	2	Q	Q	210	210	220	220	220	220	220	220		
10									Q	Q	Q	Q	2	2	2	2	220	220	220	220	220	220	220	220	
11									Q	Q	Q	Q	220	H	230	Q	Q	Q	Q	Q	Q	Q	Q	Q	
12									Q	Q	Q	Q	230	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
13									Q	Q	Q	Q	2	2	2	2	210	210	210	210	210	210	210	210	
14									Q	Q	Q	Q	220	2	2	2	2	220	220	220	220	220	220	220	220
15									Q	C	230*	210	H	220	H	220	220	220	220	220	220	220	220	220	
16									Q	Q	Q	Q	230	230	220	Q	Q	Q	Q	Q	Q	Q	Q	Q	
17									Q	Q	Q	Q	220	(23)0	B	Q	T	Q	Q	Q	Q	Q	Q	Q	Q
18									Q	Q	230	220	210	200	[210]e	220	[220]c	220	220	(23)0	B	Q	Q	Q	
19									Q	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	
20									Q	Q	Q	Q	220	T	210	200	230	220	220	220	220	220	220	220	220
21									Q	Q	Q	Q	210	B	220	Q	220	Q	220	Q	B	Q	Q	Q	
22									Q	Q	Q	Q	230	230	220	[220]e	220	H	Q	Q	Q	Q	Q	Q	Q
23									Q	Q	M	M	M	M	M	210	210	210	210	210	210	210	210		
24									Q	K	Q	K	230	K	230	K	200	K	250	K	240	K	250	K	270
25									Q	K	230	K	210	K	220	K	200	K	230	K	230	K	230	K	230
26									Q	220	Q	A	220	H	200	(210)0	230	230	230	230	230	230	230	230	
27									Q	210	200	190	200	300	(24)0	8	230	J	230	H	230	H	230	H	230
28									Q	Q	210	200	Q	230	[220]e	200	200	220	220	220	220	220	220	220	
29									Q	Q	Q	Q	210	210	200	210	[220]e	220	220	220	220	220	220	220	220
30									Q	220	210	200	210	200	200	H	230	220	220	220	220	220	220	220	
31									Q	230	Q	210	Q	230	Q	230	Q	230	230	H	230	H	230	H	230

\* DATA FROM STERLING FIELD STATION  
□ TIME OF OBSERVATION DOUBTFUL

Sweep 10 sec to 25.0 Mc in 0.5 min  
Morning Lit Automatic □

TABLE 40  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
IONOSPHERIC DATA

Form adopted June 1946  
National Bureau of Standards  
U.S. Government  
Scaled by: B. E. B., J. S.,  
Calculated by: By H. - J. W.,

Day	75°W Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	
1	Q	Q	Q	Q	Q	Q	Q	Q	Q	M	M	Q	
2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
3	Q	Q	Q	Q	Q	Q	Q	Q	L	Q	Q	Q	
4	Q	Q	Q	Q	Q	Q	Q	L	L	Q	Q	Q	
5	Q	Q	Q	L	L	L	L	L	L	Q	Q	Q	
6	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
7	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
8	C	C	C	C	C	C	C	C	C	C	C	C	
9	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
10	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
11	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
12	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
13	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
14	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	
16	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
17	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
18	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
19	C	C	C	C	C	C	C	C	C	C	C	C	
20	Q	Q	T	T	L	(4.9) <sup>P</sup>	4.9	5.2	L	L	L	Q	
21	Q	Q	L	L	B	L	Q	L	Q	B	Q	Q	
22	Q	Q	Q	Q	Q	Q	L	L	M	(4.3) <sup>P</sup>	Q	Q	
23	Q	Q	M	M	M	M	M	M	M	Q	Q	Q	
24	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
25	Q	K	L	K	(4.7) <sup>P</sup>	5.0	K	4.5	K	4.6	K	4.7	K
26	Q	L	Q	L	L	(5.8) <sup>P</sup>	(5.0) <sup>P</sup>	4.6	Z	L	Q	Q	
27	Q	L	(4.2) <sup>P</sup>	N	4.8	L	5.0	4.9	L	L	Q	Q	
28	Q	Q	Q	L	L	Q	L	C	4.7	L	Q	Q	
29	Q	Q	Q	L	L	L	L	M	L	Q	Q	Q	
30	Q	L	L	(4.9) <sup>P</sup>	5.4	(5.3) <sup>P</sup>	L	L	Q	Q	Q	Q	
31	Q	L	Q	L	Q	L	L	L	(4.7) <sup>P</sup>	L	Q	Q	
Median Count	—	—	—	—	5.0	4.9	5.0	4.9	—	—	—	—	
Count	1	3	4	8	7	7	5	3	1	1	1	1	

\* DATA FROM STERLING FIELD STATION  
□ TIME OF OBSERVATION DOUBTFUL

Sweep 1.0...Mc to 25.0 Mc in 0.5 min  
Manual □ Automatic ☒

**TABLE 41**  
National Bureau of Standards,  
**IONOSPHERIC DATA**

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

hE (Characteristic)	Km (Unit)	March		(1950)		Km Observed at Washington, D. C.	Lat 38.7°N, Long 77.1°W
		00	01	02	03		
1	.						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

DATA FROM STEERING FIELD STATION  
 TIME OF OBSERVATION DOUBTFUL

Manual □ Automatic ☑

Manual    Automatic

Manual  Automatic

**TABLE 42**  
 Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
**IONOSPHERIC DATA**

Day	75°W Mean Time												75°W Mean Time															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Char.	foE	Mc	(Unit)	March	(Month)	Washington, D.C.	Observed at	Lat 38°N	Long 77.°W	foE	Mc	(Unit)	March	(Month)	Washington, D.C.	Observed at	Lat 38°N	Long 77.°W	foE	Mc	(Unit)	March	(Month)	Washington, D.C.	Observed at			
1	-	-	-	-	-	-	-	1.7	2.4	2.9	3.1	3.3	(3.3)B	3.4	M	M	2.7	A	-	-	-	-	-	-				
2	-	-	-	-	-	-	-	2.4	2.9	3.2	[3.4]B	(3.5)B	3.5	3.4	3.2	2.8	(2.2)B	-	-	-	-	-	-	-				
3	-	-	-	-	-	-	-	1.9	2.5	3.0	3.3	3.4	B	B	(3.1)B	2.8	2.2	-	-	-	-	-	-	-				
4	-	-	-	-	-	-	-	2.5	3.0	(3.4)F	3.6	3.6	3.5	[3.4]S	3.2	2.9	2.4	-	-	-	-	-	-	-				
5	-	-	-	-	-	-	-	1.9	(2.4)F	2.9	3.2	B	B	(3.4)F	(3.4)F	3.2	(2.9)A	2.4	-	-	-	-	-	-				
6	-	-	-	-	-	-	-	1.8	2.4	2.8	3.1	3.2	B	B	B	B	3.0	2.5	-	-	-	-	-	-				
7	-	-	-	-	-	-	-	(2.1)K	A	K	B	K	B	K	(3.5)F	3.4	K	3.3	K	3.0	K	3.0	K	3.0	K	-		
8	-	-	-	-	-	-	-	-	3.0	3.3	3.7	[3.7]B	3.8	3.7	3.5	3.5	3.0	(2.5)S	S	-	-	-	-	-	-			
9	-	-	-	-	-	-	-	1.9	2.7	3.1	(3.3)F	3.6	3.6	3.7	3.6	3.4	3.2	2.6	-	-	-	-	-	-	-			
10	-	-	-	-	-	-	-	2.0	2.7	3.1	3.5	[3.6]B	3.7	3.8	3.5	3.4	3.1	2.5	1.7	-	-	-	-	-	-	-		
11	-	-	-	-	-	-	-	2.0	[2.4]P	3.3	3.4	3.5	B	B	3.5	3.3	2.9	2.5	1.7	-	-	-	-	-	-	-		
12	-	-	-	-	-	-	-	2.0	2.7	3.1	3.5	3.5	3.6	3.7	3.5	3.4	3.1	2.5	1.8	-	-	-	-	-	-	-		
13	-	-	-	-	-	-	-	2.0	(2.8)A	3.2	3.4	3.7	3.7	3.6	3.5	3.2	3.0	2.5	(1.6)S	S	-	-	-	-	-	-	-	
14	-	-	-	-	-	-	-	C	3.1	C	C	[3.4]B	3.4	3.5	3.3	3.2	2.8	2.4	1.8	-	-	-	-	-	-	-		
15	-	-	-	-	-	-	-	C	3.0*	3.4	3.5	3.6	3.7	3.4	3.2	3.0	2.5	1.7	-	-	-	-	-	-	-	-		
16	-	-	-	-	-	-	-	2.1	2.6	3.1	3.4	3.5	3.7	[3.6]P	3.4	(3.1)B	(2.6)B	(1.8)B	-	-	-	-	-	-	-	-		
17	-	-	-	-	-	-	-	1.9	2.7	B	B	B	T	3.4	3.3	3.1	2.5	(1.6)S	S	-	-	-	-	-	-	-		
18	-	-	-	-	-	-	-	2.2	2.5	(3.1)B	[3.4]B	3.6	C	C	C	C	B	B	(1.8)B	-	-	-	-	-	-	-		
19	-	-	-	-	-	-	-	2.0*	C	K	C	K	C	K	C	K	C	K	(1.6)S	S	-	-	-	-	-	-	-	
20	-	-	-	-	-	-	-	2.8	[3.0]T	3.2	(3.5)P	3.5	3.5	3.7	[3.4]P	3.4	3.4	3.2	3.0	2.6	1.8	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	2.2	2.7	3.1	3.3	[3.4]B	(3.6)P	(3.5)P	3.3	3.3	B	B	B	B	1.7	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	2.2	2.6	3.0	[3.2]A	3.4	3.6	[3.4]P	3.5	3.3	2.9	2.5	S	-	-	-	-	-	-	-		
23	-	-	-	-	-	-	-	2.2	2.7	M	M	M	3.5	3.2	3.0	2.5	(1.6)S	S	-	-	-	-	-	-	-			
24	-	-	-	-	-	-	-	2.2	2.8*	2.9*	3.1*	[3.3]A	3.5*	(3.4)P	3.3*	3.2*	2.8*	2.5*	1.9*	-	-	-	-	-	-	-	-	
25	-	-	-	-	-	-	-	(2.4)P	(2.9)K	(3.2)A	[3.3]A	3.4*	[3.4]B	3.5*	3.4*	3.3*	3.0*	2.5*	1.7*	-	-	-	-	-	-	-	-	
26	-	-	-	-	-	-	-	2.3	2.7	3.0	A	A	3.4	[3.4]B	2.4	3.3	3.1	2.5	1.8	-	-	-	-	-	-	-	-	
27	-	-	-	-	-	-	-	(2.3)*	2.6	3.1	B	B	B	(3.4)P	(3.3)B	3.1	2.5	(1.7)S	S	-	-	-	-	-	-	-	-	
28	-	-	-	-	-	-	-	(2.0)	(2.7)	3.0	B	B	C	B	3.3	3.0	2.6	(1.6)S	S	-	-	-	-	-	-	-	-	
29	-	-	-	-	-	-	-	(2.3)P	[2.7]B	3.1	3.1	3.6	3.6	(3.6)P	[3.5]M	3.4	3.1	2.5	1.9	-	-	-	-	-	-	-	-	
30	-	-	-	-	-	-	-	2.4	3.0	3.2	3.3	3.4	[3.4]A	3.5	3.3	3.3	3.1	2.6	2.0	-	-	-	-	-	-	-	-	
31	-	-	-	-	-	-	-	2.4	2.7	3.1	3.3	3.5	3.5	(3.4)P	3.3	3.0	2.6	(1.4)B	S	-	-	-	-	-	-	-	-	
Median	-	-	-	-	-	-	-	2.1	2.7	3.1	3.3	3.5	3.6	3.5	3.4	3.3	3.0	2.5	1.7	-	-	-	-	-	-	-	-	
Count	*	DATA FROM STERLING FIELD STATION																										
		TIME OF OBSERVATION DOUBTFUL																										
		Swept 1.0 Mc to 2.20 Mc in 95 min																										
		Manual <input type="checkbox"/> Automatic <input checked="" type="checkbox"/>																										

**TABLE 43**  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
**IONOSPHERIC DATA**

**Es**      **Mc.Km**      **March**, **1950**  
(Characteristic)    (Unit)    (Month)

Observed at **Washington, D.C.**

Lat. **38°N**, Long. **77°W**

**75°W**

Mean Time

Scaled by: **B.E.B., J.S.**,  
(Institution)

Calculated by: **By H - J.K.**

Form adopted June 1946

**National Bureau of Standards**

Scaled by: **B.E.B., J.S.**,  
(Institution)

Calculated by: **By H - J.K.**

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	M	M	G	G	G	G	G	G	G	G	
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
5	G	G	25/100	G	G	G	G	G	G	G	G	G	G	G	G	G	30/100	G	G	G	G	G	G	
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32/100	
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27/100	G	G	G	G	G	G	
11	G	C	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
17	G	G	G	G	G	G	G	G	G	G	G	G	G	T	G	G	G	G	G	G	G	G	G	
18	G	G	G	G	G	G	G	G	G	G	G	G	G	*	G	G	G	G	G	G	G	G	G	
19	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	G	C	C	C	C	G	G	G	G	G	G	G	G	T	G	G	G	G	G	G	G	G	G	
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
22	G	G	G	G	G	G	G	G	G	G	G	G	G	33/100	30/100	28/100	24/100	M	G	G	G	G	G	
23	G	G	G	G	G	G	G	G	G	G	G	G	G	M	M	G	G	G	G	G	G	G	G	
24	G	G	G	G	G	G	G	G	G	G	G	G	G	33/100	G	G	24/100	21/100	G	G	G	G	G	
25	G	G	G	G	G	G	G	G	G	G	G	G	G	29/100	25/100	29/100	31/100	28/100	G	G	G	G	G	
26	G	G	G	G	G	G	G	G	G	G	G	G	G	32/100	47/100	33/100	27/100	G	G	G	G	G	G	
27	G	G	G	G	G	G	G	G	G	G	G	G	G	30/100	33/100	G	G	G	G	G	G	G	G	
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29	G	G	G	G	G	G	G	G	G	G	G	G	G	30/100	32/100	23/100	M	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
31	G	G	G	G	G	G	G	G	G	G	G	G	G	73/100	G	G	G	G	G	G	G	G	G	
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	
Count	27	24	25	26	26	27	27	27	26	26	27	27	26	26	28	28	27	27	27	31	30	30	30	29

\* DATA FROM STERLING FIELD STATION

\*\* MEDIAN FEES LESS THAN MEDIAN FOR OR LESS  
THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in 5 min

Manual

Automatic

TABLE 44  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

**IONOSPHERIC DATA**  
**Lat. 38°7'N, Long. 77°1'W**

(M1500)F2, March, 1950

(Month)

Washington, D.C.

Observed at <sup>50</sup>

Mean Time

National Bureau of Standards  
Scaled by: B.E.B., J.S. (Institution)

Day	75°W												23											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-1.8	(1.0) <sup>S</sup>	1.8	1.9	(1.7) <sup>S</sup>	(1.7) <sup>S</sup>	1.9 <sup>F</sup>	2.2	2.2	(2.1) <sup>S</sup>	2.0	2.0	(2.0) <sup>F</sup>	M	M	2.1	2.0	(2.0) <sup>S</sup>	(2.0) <sup>S</sup>	1.9	1.9	1.9	1.9	1.8
2	-1.8	1.8	(1.8) <sup>S</sup>	(1.9) <sup>S</sup>	(1.9) <sup>S</sup>	(1.9) <sup>S</sup>	1.8	(2.2) <sup>S</sup>	2.1	(2.2) <sup>S</sup>	2.2	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
3	1.9	(1.9) <sup>S</sup>	(1.8) <sup>T</sup>	1.8	(1.8) <sup>S</sup>	1.9	1.9	(2.2) <sup>S</sup>	2.2	(2.2) <sup>S</sup>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
4	1.9	1.9	1.9	1.9	(2.0) <sup>S</sup>	(2.0) <sup>S</sup>	1.9	(1.9) <sup>S</sup>	2.1	2.1	(2.2) <sup>S</sup>	2.0	(2.0) <sup>S</sup>	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
5	1.9	1.8	1.9	1.9	(2.1) <sup>S</sup>	(2.1) <sup>S</sup>	1.8	2.2	2.2	(2.2) <sup>S</sup>	2.2	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
6	1.7	1.7	1.7	1.9	1.8	(2.0) <sup>S</sup>	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7	1.8	1.7	1.6	1.7	(1.7) <sup>S</sup>	(1.7) <sup>S</sup>	1.6 <sup>F</sup>	(1.6) <sup>S</sup>	(1.6) <sup>S</sup>	(1.6) <sup>S</sup>	2.0 <sup>F</sup>	1.9 <sup>K</sup>	1.9 <sup>K</sup>	2.0	1.9 <sup>K</sup>									
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9	1.7	(1.8) <sup>S</sup>	(1.8) <sup>S</sup>	1.9 <sup>F</sup>	1.9 <sup>S</sup>	2.0	2.0	2.0	2.0	2.0	(1.9) <sup>S</sup>	2.0	2.0	(2.0) <sup>S</sup>	(2.0) <sup>S</sup>	1.9	1.9	1.8	1.8					
10	1.7	(1.7) <sup>F</sup>	1.7	1.8 <sup>F</sup>	1.9 <sup>F</sup>	1.9 <sup>F</sup>	2.2	2.1	2.2	(2.0) <sup>S</sup>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
11	1.8 <sup>F</sup>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12	(1.8) <sup>F</sup>	1.9 <sup>F</sup>	(1.8) <sup>T</sup>	1.8 <sup>F</sup>	(1.8) <sup>F</sup>	(1.8) <sup>F</sup>	1.9 <sup>F</sup>	1.8 <sup>F</sup>	1.8 <sup>F</sup>	2.1 <sup>F</sup>	2.1	2.1	2.1	2.0	(2.0) <sup>S</sup>	2.0	2.0	(2.0) <sup>S</sup>	(1.9) <sup>S</sup>					
13	1.8	1.8	1.8	1.9	1.9	1.8	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	1.7	(1.6) <sup>S</sup>	(1.7) <sup>S</sup>	1.7	1.7	1.7	1.7	1.7	1.7	1.7	2.1 <sup>F</sup>	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	
17	(1.8) <sup>S</sup>	(1.7) <sup>F</sup>	(1.8) <sup>S</sup>	(1.8) <sup>S</sup>	(1.8) <sup>S</sup>	(1.8) <sup>S</sup>	1.8 <sup>F</sup>	(1.7) <sup>S</sup>	(1.7) <sup>S</sup>	2.0 <sup>F</sup>	2.1 <sup>F</sup>	2.0	2.0	1.9	1.9 <sup>F</sup>	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	
18	(1.7) <sup>S</sup>	(1.8) <sup>F</sup>	1.8 <sup>F</sup>	1.7	1.6	1.6	1.6	1.6 <sup>F</sup>	1.7 <sup>F</sup>	1.9 <sup>F</sup>	2.0 <sup>F</sup>	2.0	2.0	2.0	1.9	1.9 <sup>F</sup>	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
19	(1.8) <sup>F</sup>	C	K	C	K	C	K	(1.6) <sup>F</sup>	C	K	C	K	C	K	C	K	C							
20	1.6 <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>		
21	(1.8) <sup>F</sup>	(1.7) <sup>F</sup>	(1.7) <sup>F</sup>	(1.8) <sup>F</sup>																				
22	(1.6) <sup>F</sup>	(1.7) <sup>F</sup>	(1.6) <sup>F</sup>																					
23	(1.9) <sup>S</sup>	(1.9) <sup>S</sup>	(1.8) <sup>S</sup>	(1.7) <sup>S</sup>																				
24	(1.6) <sup>S</sup>	(1.7) <sup>F</sup>	(1.6) <sup>F</sup>																					
25	K	(1.8) <sup>F</sup>	(1.7) <sup>F</sup>	(1.6) <sup>S</sup>																				
26	(1.7) <sup>S</sup>	1.7	(1.6) <sup>S</sup>																					
27	(1.6) <sup>S</sup>	1.5	(1.7) <sup>S</sup>																					
28	(1.6) <sup>S</sup>	1.4	(1.7) <sup>S</sup>																					
29	(1.7) <sup>S</sup>	(1.8) <sup>F</sup>																						
30	(1.7) <sup>S</sup>	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
31	1.7 <sup>F</sup>	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
Median	1.8	1.7	1.8	1.8	1.8	1.8	1.9	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Count	28	25	26	27	27	27	28	28	28	27	28	28	28	28	27	27	27	28	28	27	29	31	30	29

\* DATA FROM STERLING FIELD STATION  
□ TIME OF OBSERVATION DOUBTFUL

Manual □ Automatic

Mc 10-250 Mc in 0.5 min

**TABLE 45.**  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
**IONOSPHERIC DATA**

National Bureau of Standards  
Scaled by: B.E.B., J.S.  
(Institution)

(Characteristic)      March      1950  
(Unit)      (Month)

Observed at: Washington, D.C.

Lat: 38°7'N

Long: 77°10'W

Day	75°W												Neon Time													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	(2.8) <sup>s</sup>	2.8	2.8	(2.7) <sup>s</sup>	(2.6) <sup>s</sup>	2.9 <sup>f</sup>	3.2	(3.2) <sup>s</sup>	(3.2) <sup>s</sup>	3.2	(3.2) <sup>s</sup>	(3.2) <sup>s</sup>	3.1	(3.0) <sup>s</sup>	(3.0) <sup>s</sup>	(3.0) <sup>s</sup>	(3.0) <sup>s</sup>	(3.1) <sup>s</sup>	(3.1) <sup>s</sup>	3.2	3.0	(2.9) <sup>s</sup>	2.8	2.8		
2	2.8	2.7	2.7	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	2.7	(2.6) <sup>s</sup>	(2.6) <sup>s</sup>	2.8	(3.3) <sup>s</sup>	3.3	3.1 <sup>f</sup>	2.8	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.0	(2.9) <sup>s</sup>	2.9	(2.9) <sup>s</sup>	
3	2.9	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.7) <sup>s</sup>	2.7	(2.7) <sup>s</sup>	2.9	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	3.3	(3.2) <sup>s</sup>	3.3	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	(2.9) <sup>s</sup>	(2.9) <sup>s</sup>	
4	2.9	2.9	2.8	2.9	(3.0) <sup>s</sup>	2.9	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	3.3	3.1	3.2	3.0	(3.1) <sup>s</sup>	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	2.9	2.9	2.9	2.9	(3.1) <sup>s</sup>	2.8	2.9	(3.3) <sup>s</sup>	3.3	3.3	(3.2) <sup>s</sup>	3.2	2.9	3.0	3.0	3.0	3.0	3.0	(3.1) <sup>s</sup>	(3.0) <sup>s</sup>	3.0	3.0	3.0	3.0	3.0	3.0
6	2.7	2.6	2.7	2.9	2.8	2.7	(3.0) <sup>s</sup>	3.1	3.3	3.0	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
7	2.7	2.6	2.5	2.5	(2.6) <sup>s</sup>	2.4 <sup>f</sup>	(2.4) <sup>s</sup>	(3.1) <sup>s</sup>	2.9 <sup>f</sup>	2.8 <sup>f</sup>	2.9 <sup>f</sup>	2.8 <sup>f</sup>	2.9 <sup>f</sup>	2.8 <sup>f</sup>												
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9	2.7	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	2.9	F	2.8	(2.7) <sup>s</sup>	2.7	3.0	(3.2) <sup>s</sup>	3.2	3.0	2.9	(2.9) <sup>s</sup>	2.9	2.9	3.0	(2.9) <sup>s</sup>	3.0	3.0	2.9	2.8	2.8	2.8	2.8	2.8
10	2.7	(2.6) <sup>s</sup>	2.7	2.9	F	2.8	F	2.9	F	3.3	3.2	3.2	(3.0) <sup>s</sup>	2.9	3.0	(2.9) <sup>s</sup>	2.9	(2.9) <sup>s</sup>	2.9	2.9	(2.8) <sup>s</sup>	3.0	2.7	(2.8) <sup>s</sup>	2.8	2.7
11	2.8	F	C	2.8	F	2.8	F	2.8	F	3.0	F	3.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
12	(2.8) <sup>s</sup>	F	(2.8) <sup>s</sup>	2.8	F	2.8	F	2.8	F	(2.8) <sup>s</sup>	3.1	F	3.2	3.1	2.8	2.8	2.8	2.8	2.8	2.8	(2.8) <sup>s</sup>	2.9	2.8	2.8	2.8	2.8
13	2.7	2.8	2.7	2.8	2.8	2.8	2.8	2.8	3.0	3.1	3.3	3.1	2.9	3.0	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	2.6	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	2.5	2.5	2.6	2.9	F	3.2	F	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
17	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	2.7	F	(2.6) <sup>s</sup>	2.7	F	3.1	F	3.1	F	3.1	F	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
18	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	2.7	F	2.6	F	(2.5) <sup>s</sup>	2.5	F	2.6	F	2.9	F	3.2	F	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
19	(2.8) <sup>s</sup>	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	G	K	2.6	K	2.7	K	2.7
20	2.5	F	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	C	K	G	K	2.4	F	(2.4) <sup>s</sup>	(2.4) <sup>s</sup>
21	(2.8) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	2.7	F	(3.0) <sup>s</sup>	2.6	F	(2.7) <sup>s</sup>	3.1	F	(3.2) <sup>s</sup>	3.1	F	(2.8) <sup>s</sup>	2.8	F	(2.7) <sup>s</sup>	(2.8) <sup>s</sup>	2.8	F	(2.8) <sup>s</sup>	2.8	2.8	(2.5) <sup>s</sup>
22	(2.4) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	5	F	(3.0) <sup>s</sup>	(3.2) <sup>s</sup>	3.0	(2.9) <sup>s</sup>	2.9	2.9	2.9	2.9	(2.7) <sup>s</sup>	2.9	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	
23	(2.9) <sup>s</sup>	(2.7) <sup>s</sup>	(2.8) <sup>s</sup>	(2.8) <sup>s</sup>	2.9	F	(3.2) <sup>s</sup>	2.9	F	(2.7) <sup>s</sup>	2.9	F	(2.7) <sup>s</sup>	(2.8) <sup>s</sup>	2.9	F	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>						
24	(2.5) <sup>s</sup>	(2.6) <sup>s</sup>	(2.5) <sup>s</sup>	(2.5) <sup>s</sup>	2.7	F	(3.0) <sup>s</sup>	(2.6) <sup>s</sup>	(2.7) <sup>s</sup>	(2.7) <sup>s</sup>	(2.6) <sup>s</sup>															
25	(2.8) <sup>s</sup>	P	2.6	K	(2.3) <sup>s</sup>	(2.3) <sup>s</sup>	(2.3) <sup>s</sup>	(2.4) <sup>s</sup>	(2.4) <sup>s</sup>	(2.4) <sup>s</sup>	(2.5) <sup>s</sup>															
26	(2.5) <sup>s</sup>	2.6	(2.7) <sup>s</sup>	(2.8) <sup>s</sup>	2.7	(2.8) <sup>s</sup>	3.0	3.2	2.8	2.9	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9						
27	(2.5) <sup>s</sup>	2.4	(2.6) <sup>s</sup>	2.7	(2.7) <sup>s</sup>																					
28	(2.5)	(2.6)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	(2.7)	
29	(2.6) <sup>s</sup>	(2.7) <sup>s</sup>																								
30	(2.7) <sup>s</sup>	(2.6)	2.6	(2.7) <sup>s</sup>																						
31	2.6	F	2.7	F																						
Median	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	
Count	25	26	27	27	27	27	27	27	28	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	

\* DATA FROM STERLING FIELD STATION

□ TIME OF OBSERVATION DOUBTFUL

Sweep I.O. Mc 10.250 Mc in 0.5 min

Manual □ Automatic ☒

**TABLE 46**  
 Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
**IONOSPHERIC DATA**  
 (MARCH 1950)  
 (Characteristic) **Washington, D.C.**  
 Observed at **Lat. 38°7'N., Long. 77°1'W.**

Day	75°W												Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Median																									
Count																									

\* DATA FROM STERLING FIELD STATION  
 □ TIME OF OBSERVATION DOUBTFUL

Sweep 1.0 Mc to 25.0 Mc in 0.5 min  
 Manual  Automatic

TABLE 47  
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.  
IONOSPHERIC DATA

(M1500)E, March, 1950  
(Characteristic) (Unit)  
Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
Median																								
Count																								

\* DATA FROM STERLING FIELD STATION  
□ TIME OF OBSERVATION DOUBTFUL

Sweep 10 Mc to 25.0 Mc in 0.5 min  
Manual □ Automatic ☒

Mean Time  
Calculated by: B. E. B., J. S. (Institution)

Table 48Ionospheric Storminess at Washington, D. C.March 1950

Day	Ionospheric character*		Principal storms		Geomagnetic character*	
	00-12 GCT	12-24 GCT	Beginning GCT	End GCT	00-12 GCT	12-24 GCT
1	1	2			3	1
2	2	2			3	2
3	2	2			2	1
4	1	2			1	2
5	1	3			2	2
6	1	3			3	2
7	1	4			4	2
8	***	2	0900	##	2	2
9	1	1			3	1
10	1	1			2	1
11	1	2			0	1
12	1	0			1	2
13	1	1			1	2
14	***	1			3	3
15	***	3			4	2
16	2	1			2	1
17	1	2			2	2
18	2	1			2	1
19	4	#	0600	----	5	5
20	4	3	----	1100	1	2
21	2	2			3	3
22	3	3			4	3
23	1	1			2	2
24	3	6	1200	----	4	2
25	4	4	----	----	3	2
26	4	3	----	0500	1	2
27	2	3			4	4
28	2	1			3	1
29	2	1			3	2
30	2	2			3	1
31	2	1			2	4

\*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D.C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

\*\*Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

----Dashes indicate continuing storm.

\*\*\*No readable record. Refer to table 37 for detailed explanation.

#No I-figure owing to insufficient data. Conditions probably severely disturbed.

##Time of ending unknown because of lack of record.

Table 49Sudden Ionosphere Disturbances Observed at Washington, D. C.March 1950

1950 Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
March 5	1612	1655	Ohio, D. C., England	0.1	Solar flare*** 1608
8	2159	2210	Ohio, D. C.	0.2	
9	2040	2110	D. C.	0.1	Solar flare*** 2036
10	1551	1620	D. C.	0.1	Solar flare*** 1549
12	1420	1500	Ohio, D. C., England	0.1	
12	1928	1955	Ohio, D. C., England	0.1	Terr.mag.pulse** 1930-1945
16	1830	1950	Ohio	0.03	Solar flare*** 1840
19	1410	1705	Ohio, D. C.	0.03	
21	1510	1550	Ohio, D. C.	0.0	
21	2029	2220	Ohio, D. C., England	0.0	Terr.mag.pulse** 2015-2050

\*Ratio of received field intensity during SID to average field intensity before and after, for station KQ2XAU (formerly W8XAL), 6080 kilocycles, 600 kilometers distant, for all SID except the following: Station WWI, 2061 kilocycles, received at Ft. Belvoir, Virginia, 35 kilometers distant, was used for the SID on March 9 and 10.

\*\*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

\*\*\*Time of observation at the High Altitude Observatory, Boulder, Colorado.

Table 50

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,  
Cable and Wireless, Ltd., as Observed in England

1950 Day	GCT		Receiving station	Location of transmitters	Other phenomena
	Beginning	End			
February					
14	1730	1830	Brentwood	Barbados, Chile, Colombia, Uruguay, Venezuela	Solar flare* 1715
15	0630	0800	Brentwood	Afghanistan, Bahrein I., Eritrea, India, Iran, Kenya, Southern Rhodesia, Switzerland, Trans-Jordan	
20	1527	1550	Brentwood	Austria, Barbados, Belgian Congo, Canary Is., Chile, Colombia, Spain, Switzerland, Trans-Jordan, Uruguay, Venezuela	
20	1524	1545	Somerton	Argentina, Brazil, Canada, China, Gold Coast, New York, Union of S. Africa	
21	1010	1040	Brentwood	Bahrein I., Barbados, Belgian Congo, Bulgaria, Canary Is., Greece, India, Iran, Kenya, Malta, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar	
21	1010	1040	Somerton	Aden, Argentina, Australia, Brazil, Canada, Ceylon, Egypt, Gold Coast, India, New York, Union of S. Africa	
21	2005	***	Brentwood	Chile, Colombia, Venezuela	
22	1015	1045	Brentwood	Belgian Congo, Greece, Iran, Portugal, Southern Rhodesia, Spain, Switzerland, Zanzibar	
23	0715	0735	Brentwood	Afghanistan, India, Iran, Kenya, Southern Rhodesia, Syria, Trans-Jordan	Solar flare** 0712
23	0724	0735	Somerton	Aden, Ceylon, China, India, Union of S. Africa	Solar flare** 0712
23	1200	1440	Somerton	Canada, New York	

\*Time of observation at the High Altitude Observatory, Boulder, Colorado.

\*\*Time of observation at Wendelstein Observatory, Germany.

\*\*\*Incomplete recovery of SID.

Table 51

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,  
Cable and Wireless, Ltd., as Observed at Colombo, Ceylon

1950 Day	GCT		Location of transmitters
	Beginning	End	
January 20	1105	1130	England

Table 52

Sudden Ionosphere Disturbances Reported by International Telephone and  
Telegraph Corporation, as Observed at Platanos, Argentina

1950 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
February 13	1916	2005	Bolivia, Brazil, Chile, Cuba, Denmark, Italy, New York, Peru, Spain, Switzerland, Venezuela	Terr. mag. pulse* 1915-1930 Solar flare** 1910
18	1400	1430	Bolivia, Brazil, Cuba, Denmark, Germany, New York, Peru, Switzerland, Venezuela	
20	1525	1555	Bolivia, Brazil, Cuba, Denmark, Germany, New York, Peru, Venezuela	

\*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

\*\*Time of observation at the High Altitude Observatory, Boulder, Colorado.

Table 53

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.,  
as Observed at Point Reyes, California

1950 Day	GCT		Location of transmitters
	Beginning	End	
March 8	0440	0510	French Indo-China, Java, Philippine Is.

Table 54

Sudden Ionosphere Disturbances Reported by Technical Supervisor,  
Mackay Radio and Telegraph Company, Inc.,  
as Observed in New York

1950 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
February 13	1913	1950	Africa, Asia, Central America, Europe, South America	Terr.mag.pulse* 1915-1930 Solar flare** 1910
20	1520	1545	Africa, Asia, Central America, Europe, South America	

\*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

\*\*Time of observation at the High Altitude Observatory, Boulder, Colorado.

Table 55

Sudden Ionosphere Disturbances Reported by Institut für Ionosphärenforschung,  
as Observed at Lindau, Harz, Germany

Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
<b>February 1950</b>					
18	1038	1058	Munchen**, Berlin***, Lindau#	0.12	
18	1355	1420	Munchen**, Berlin***, Lindau#	0.11	
19	1402	1422	Munchen**	0.17	
20	1230	1255	Munchen**, Berlin***	0.05	
20	1520	1528	Munchen**, Berlin***	0.02	Terr.mag.pulse## 1520-1535
21	1008	1040	Munchen**, Berlin***, Lindau#	0.012	Terr.mag.pulse## 1013-1030
23	0720	0735	Munchen**, Berlin***, Lindau#	0.09	

\*Ratio of received field intensity during SID to average field intensity before and after, for station Voice of America, 6078.9 kilocycles, 400 km distant.

\*\*Station Voice of America, 6078.9 kilocycles.

\*\*\*Station DAB, 3840 kilocycles, 200 km distant.

#Lindau station, 1780 kilocycles, pulse, transmitter and receiver at Lindau.

##As observed at Lindau.

Table 56

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,  
Cable and Wireless, Ltd., as Observed in Barbados, B.W.I.

1950 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
February 2	0620	0830	Australia	
13	1920	1945	British Guiana, Canada, England	Terr. mag. pulse* 1915-1930 Solar flare** 1910
14	1720	1840	Windward Is.	Solar flare** 1715
15	0635	0735	Australia	
17	0120	0300	Australia	
20	1520	1600	British Guiana, Canada, England, Jamaica, West Indies	
21-22	2345	0345	Australia	

\*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

\*\*Time of observation at the High Altitude Observatory, Boulder, Colorado.

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Table 57

Provisional Radio Propagation Quality Figures  
 (Including Comparisons with CRPL Warnings and Forecasts)  
February 1950

Day	North Atlantic quality figure	CRPL* Warning	CRPL Forecasts (J-reports)	North Pacific quality figure	Geo- mag- netic K <sub>Ch</sub>	
	Half day GCT (1)	Half day GCT (2)	Half day GCT (1)	Half day GCT (2)	Half day GCT (1)	
1	6 6			6 7	2 1	
2	(3) 5		W	5 5	(4) 3	
3	5 5	U		6 5	3 3	
4	(4) 5	U U		6 5	2 3	
5	6 6	U		6 6	2 1	
6	6 6			6 7	2 2	
7	5 6	U		7 7	3 3	
8	5 6			6 7	3 2	
9	5 6			5 6	2 2	
10	6 6			6 7	1 1	
11	6 7			6 7	2 1	
12	6 7			6 7	1 2	
13	6 6			6 7	1 1	
14	7 6			6 7	1 2	
15	7 6			6 8	2 2	
16	7 7			7 7	1 1	
17	7 7			6 6	1 1	
18	7 7			6 7	0 2	
19	7 7		X	7 7	2 2	
20	7 (4)	W	X	7 6	2 (5)	
21	(3) 5	W W	X	5 5	(5) (4)	
22	6 5	W W	X	5 5	(4) 3	
23	5 (4)	W W		5 (4)	3 (5)	
24	(4) 6	W U		5 5	(5) 2	
25	5 6	U	X	5 6	3 2	
26	7 7			6 6	1 0	
27	7 7			6 7	1 2	
28	7 6			6 7	3 3	

Score:	Warning		Forecast		
	N.A.	N.P.	N.A.	N.P.	
H	9	4	2	0	
(M)	0	0	0	0	
M	1	0	4	1	
G	39	40	42	45	
O	7	12	8	10	

Scales:  
 Quality Figures  
 (1) - Useless  
 (2) - Very poor  
 (3) - Poor  
 (4) - Poor to fair  
 5 - Fair  
 6 - Fair to good  
 7 - Good  
 8 - Very good  
 9 - Excellent

Geomagnetic K<sub>Ch</sub> - 0 to 9,  
 9 representing the greatest  
 disturbance; K<sub>Ch</sub> > 4 indicates  
 significant disturbance,  
 enclosed in ( ) for emphasis.

Symbols:  
 W Disturbed conditions  
 expected

U Unstable conditions  
 expected

N No disturbance expected

X Probable disturbed date

Scoring:  
 H Storm (Q < 4) hit

(M) Storm severer than  
 predicted

M Storm missed

G Good day forecast

O Overwarning

Scoring by half day according  
 to following table:

Quality Figure	≤ 3	4	5	≥ 6
----------------	-----	---	---	-----

W	H	H	O	O
---	---	---	---	---

U	(M)	H	H	O
---	-----	---	---	---

N	M	M	G	G
---	---	---	---	---

X	H	H	O	O
---	---	---	---	---

\*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast. ( ) broadcast for one-quarter day. Blanks signify N.

Table 58American and Zurich Provisional Relative Sunspot NumbersMarch 1950

Date	R <sub>A</sub> *	R <sub>Z</sub> **	Date	R <sub>A</sub> *	R <sub>Z</sub> **
1	102	88	17	128	100
2	88	62	18	105	108
3	120	83	19	113	101
4	171	128	20	111	90
5	189	134	21	95	80
6	182	148	22	79	70
7	226	184	23	77	76
8	231	187	24	88	72
9	192	163	25	112	73
10	176	150	26	89	80
11	181	156	27	92	73
12	165	128	28	104	69
13	153	124	29	139	97
14	160	133	30	111	100
15	160	130	31	94	78
16	139	110	Mean:	134.6	108.9

\*Combination of reports from 44 observers; see page 8.

\*\*Dependent on observations at Zurich Observatory and its stations at Locarno and Arosa.

Table 59a

Coronal observations at Climax, Colorado (5303A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																					
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																					
Mar. 1.7	-	-	-	-	-	-	-	-	-	3	7	16	17	22	31	38	38	31	23	18	20	26	18	12	6	3	1	-	-	-	-	-	-	2	1	1	
4.9	-	-	-	-	-	-	-	-	-	3	4	8	11	18	21	20	16	13	11	12	15	14	13	12	11	9	5	2	2	-	-	-	-	-	-	-	-
5.6	2	1	-	1	2	1	1	2	4	4	4	5	17	23	22	21	18	16	13	15	18	17	14	14	10	7	4	3	4	3	2	2	3	2			
11.0a	X	X	X	X	X	X	X	X	X	3	3	2	3	5	7	6	7	5	4	3	2	2	1	-	-	2	-	-	X	X	X	X	X				
13.7a	-	-	-	-	-	-	-	-	-	3	2	3	7	8	9	10	8	6	3	4	5	4	4	2	2	2	2	-	-	-	-	-	-	-	-	-	
16.7	2	3	3	4	4	3	4	6	8	10	11	12	14	22	19	15	17	16	14	13	9	5	5	9	9	8	4	5	5	6	7	5	3	1	-		
17.9	2	1	2	2	3	3	X	X	X	8	13	13	14	13	13	13	13	13	11	10	8	11	9	7	10	9	5	5	2	3	4	4	3	X	X	X	X
23.7	2	2	2	2	2	2	4	4	4	5	8	8	11	13	12	11	10	9	8	7	11	10	4	2	3	1	1	2	2	1	1	-	-	-	-		
29.7a	2	-	-	-	2	2	3	6	8	12	13	14	15	16	14	11	8	8	8	7	6	8	9	8	4	3	3	-	-	-	-	-	-	-	-	-	

Table 60a

Coronal observations at Climax, Colorado (6374A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																				
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
1950																																				
Mar. 1.7	-	-	-	3	3	4	4	4	1	1	-	-	-	1	1	2	4	23	23	9	5	1	2	2	3	4	3	3	3	3	2	1	1	1	1	
4.9	1	2	2	2	2	3	2	1	-	-	-	-	-	13	10	3	5	7	-	3	8	13	8	3	-	3	4	4	-	-	-	-	-	-		
5.6	2	2	2	2	2	2	2	2	3	3	1	1	3	19	11	13	8	11	2	5	10	10	9	5	2	2	4	2	2	1	1	2	1	2		
11.0a	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	2	2	3	2	-	-	-	-	2	2	-	-	-	X	X	X	X		
13.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	9	4	3	3	1	-	-	4	-	-	-	-	-	-	-	-	-	-		
17.9	-	2	2	-	-	X	X	X	X	X	X	X	-	-	2	3	10	8	-	-	5	1	-	-	2	2	-	-	-	X	X	X	X	-	-	
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
29.7a	3	3	3	2	2	-	-	-	-	11	-	13	-	5	7	6	7	-	2	1	2	2	4	3	1	2	1	1	2	2	1	-	-	-		

Table 61a

Coronal observations at Climax, Colorado (6704A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																				
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
1950																																				
Mar. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	2	1	2	2	2	2	1	-	-	-	-	-	-	-		
4.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	1	2	1	1	1	2	1	1	-	-	2	1	1	-	-		
5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	1	1	1	1	2	2	2	2	1	-	-	-	-	-	-	-		
11.0a	X	X	X	X	X	X	X	X	X	X	X	X	-	2	3	3	2	1	1	1	3	3	1	1	2	1	1	-	1	1	X	X	X			
13.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	3	5	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-		
16.7	-	-	1	-	-	-	-	-	-	1	2	2	2	5	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
17.9	-	-	-	-	-	X	X	X	X	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	
23.7	-	-	-	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	-	-	2	2	2	-	-			
29.7a	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	-	2	2	2	2	2	2	2	2	-	2	2	2	-	-	-	-	-	-	-	

Table 59b

### Coronal observations at Climax, Colorado (5303A), west limb

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator																				
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20		5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		
1950																																					
Mar. 1.7	1	2	3	3	6	8	9	9	9	9	10	11	14	13	14	14	15	16	23	34	23	26	21	19	12	9	10	10	8	6	6	7	6	3	-	-	
4.9	-	-	-	1	1	2	4	4	3	5	9	3	5	8	9	12	13	14	12	13	15	15	16	20	17	12	13	10	9	7	3	2	3	4	3	1	-
5.6	2	2	2	2	5	4	3	4	11	12	9	12	13	18	20	17	13	13	14	15	15	16	26	20	17	17	15	12	12	10	8	4	5	3	3	3	
11.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
13.7	-	-	-	-	-	-	-	-	-	-	5	12	19	13	13	13	13	17	18	15	14	16	14	14	14	10	7	6	-	-	-	-	-	-	-	-	
16.7	-	-	-	-	-	-	-	-	-	-	3	8	12	14	14	13	12	12	12	13	14	15	15	15	12	3	-	-	-	-	-	-	-	3	3	2	
17.9	X	X	X	-	-	-	2	2	3	4	8	3	8	12	16	17	14	10	11	11	14	14	19	18	15	13	6	-	3	1	2	-	1	1			
23.7	-	-	-	2	4	3	4	3	5	5	8	11	12	13	14	11	9	12	13	15	17	13	11	8	9	8	8	9	9	4	3	2	2	3			
29.7	-	2	3	3	3	5	6	7	6	4	5	6	5	8	10	10	12	13	13	14	15	16	26	17	14	11	10	8	5	3	3	2	2	3			

Note: Observation low weight: Mar. 1.7 at N 15°.

Table 60b

Coronal observations at Climax, Colorado (6374A), west limb

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator																			
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20		5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
1950																																				
Mar. 1.7	1	1	1	1	-	-	-	1	1	-	-	1	3	4	2	5	9	13	13	14	21	30	14	8	3	2	1	1	1	2	1	1	-	-		
4.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	6	7	13	16	20	4	3	2	1	2	1	-	1	1	1	2	1	
5.6	2	3	2	1	1	1	2	1	2	1	1	-	-	-	-	-	13	6	3	3	15	13	3	2	2	-	-	-	-	-	4	3	-	2	2	
11.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
13.7	-	-	-	-	-	-	-	-	-	-	-	-	13	3	-	-	6	4	9	-	-	8	2	2	4	5	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	-	-	2	3	7	8	11	-	3	5	10	6	14	19	13	12	11	4	2	3	-	-	-	-	-	
17.9	X	X	X	-	5	2	-	-	2	2	2	12	4	14	10	5	6	4	3	3	2	10	4	3	4	3	2	-	-	1	1	-	-	-		
23.7	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	4	13	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	6	7	5	7	2	1	2	-	-	2	-	-	1	2	3	4	3	

Table 61b

### Coronal observations at Climax, Colorado (6704A), west limb

Table 62a

Coronal observations at Sacramento Peak, New Mexico (5303A), east limb

Date GCT	Degrees north of the solar equator										0°	Degrees south of the solar equator																										
	90	85	80	75	70	65	60	55	50	45		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90									
1950																																						
Feb. 1.7a	5	3	-	2	2	4	2	3	-	-	3	3	18	33	29	38	43	41	36	38	38	33	23	24	14	9	7	4	5	4	2	-	-	1	-	-	4	
2.9a	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	-	-	-	-	-	-					
3.7a	3	2	-	2	-	3	-	-	-	-	9	18	30	37	42	44	38	41	40	33	20	22	19	15	12	9	5	5	3	2	2	1	3	4	-	-	-	
4.7a	4	2	2	-	-	-	-	4	2	5	4	4	15	34	42	43	46	44	41	38	28	23	26	20	18	12	10	9	5	4	2	2	2	4	3	4	4	4
5.9a	-	2	3	3	3	-	3	3	3	3	5	11	19	30	42	40	35	32	26	25	21	18	14	11	8	10	6	6	-	-	-	4	4	5	4	3		
6.8a	3	2	2	-	-	-	2	4	3	4	9	18	24	30	42	43	37	35	36	37	35	15	14	15	15	11	11	11	8	7	7	5	4	4	5	5	4	
7.7a	3	2	3	1	1	-	3	-	4	8	3	10	20	29	39	39	34	29	23	35	40	15	20	18	16	12	9	6	5	4	5	3	4	5	5	4		
8.9	1	1	1	1	-	1	2	5	7	5	13	13	10	12	18	31	19	15	16	20	21	16	13	10	8	7	8	6	6	5	4	3	3	3	2			
14.9a	-	-	-	3	3	4	4	4	8	7	11	14	14	26	28	39	29	22	19	15	13	13	10	11	8	4	-	3	5	2	4	4	3	2	2			
15.9	-	-	-	-	-	3	4	5	8	9	12	13	14	30	34	38	28	20	12	13	12	12	10	9	4	2	3	2	-	-	-	-	-	-	-			
16.9	-	3	2	3	2	2	3	4	5	7	7	12	13	18	28	40	36	25	14	12	17	14	12	9	8	7	6	5	2	1	-	-	2	3	2			
17.9	-	-	-	2	3	3	5	6	8	9	11	13	19	27	29	35	23	19	18	17	15	13	11	11	10	7	5	3	2	2	3	3	3	3				
18.9	2	-	-	3	3	4	6	3	4	8	11	12	18	22	33	32	20	15	15	14	18	11	10	11	8	7	5	2	3	3	-	2	-	-	-			
21.8	2	2	4	4	3	4	8	10	11	12	13	23	20	24	19	16	17	15	17	21	20	27	15	14	11	7	7	8	2	2	-	-	-	-				
22.8	2	3	4	3	6	7	9	9	10	11	13	22	18	20	16	26	25	18	17	16	16	17	13	10	6	4	3	5	1	2	2	-	-	-				
23.9	2	-	-	3	3	4	5	5	6	9	13	11	13	13	15	18	18	14	12	13	12	13	13	9	4	2	3	2	-	-	-	-	-	-				
24.7	4	4	7	4	2	4	4	6	9	11	12	14	14	19	25	31	22	19	18	15	13	18	17	15	10	5	5	3	-	-	-	-	-	-				
25.8	3	5	4	3	2	3	4	5	5	2	12	10	12	15	23	34	34	28	18	14	16	20	19	14	9	10	8	3	-	1	1	-	-	-	-			
27.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
28.7	2	3	-	-	-	-	-	-	-	-	2	2	9	13	17	21	25	34	34	14	14	10	12	12	9	4	-	-	-	-	-	-	-	-	-	-		

Note: Observation low weight: Feb. 21.8 at S55° - S65°; Feb. 28.7 at S05° - S70°.

Table 63a

Coronal observations at Sacramento Peak, New Mexico (6374A), east limb

Date GCT	Degrees north of the solar equator										0°	Degrees south of the solar equator																									
	90	85	80	75	70	65	60	55	50	45		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90								
1950																																					
Feb. 1.7a	11	8	8	5	8	10	11	11	11	5	8	10	7	8	-	10	22	12	4	9	13	3	3	4	3	3	4	6	5	7	7	3	3	4	3	2	
2.9a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5	5	3	4	3	2					
3.7a	9	4	5	10	9	5	8	8	6	3	5	5	4	8	14	13	15	27	5	5	10	-	8	13	3	4	4	-	5	5	6	10	7	5	5	5	
4.7a	12	10	8	10	10	10	10	6	10	8	8	9	9	5	24	25	32	25	5	17	10	3	13	-	3	2	-	3	1	4	9	3	4	5	5		
5.9a	10	10	10	11	9	10	10	9	9	9	9	9	8	32	34	14	20	8	11	3	4	5	8	6	4	4	2	3	-	3	7	7	4	4	5		
6.8a	8	6	5	4	5	4	7	6	4	7	10	9	4	22	14	16	16	11	18	13	11	14	10	5	-	3	4	-	-	8	5	4	3	1	3		
7.7a	8	9	8	6	10	9	5	9	5	4	10	4	11	5	18	16	8	6	14	22	4	5	3	1	-	-	-	-	3	3	4	3	3	3			
8.9	9	4	9	6	4	2	3	3	3	2	3	3	3	1	-	11	21	9	2	2	2	4	2	5	2	1	1	-	-	-	-	-	1	3	3		
14.9a	-	3	5	5	2	3	-	3	2	1	-	2	-	3	3	5	14	7	5	3	4	3	-	1	1	-	-	-	-	-	-	-	-	-	-		
15.9	1	3	7	4	4	3	-	2	-	-	-	-	-	-	-	-	3	11	5	6	18	5	3	3	1	-	-	-	-	-	-	-	3	2	-	-	
16.9	-	4	5	-	-	3	4	3	-	-	-	4	4	9	9	19	10	3	3	5	4	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	
17.9	3	5	4	-	-	4	2	-	-	-	-	-	-	2	8	10	9	10	4	10	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18.9	4	3	5	2	3	-	-	-	-	-	-	-	-	-	-	-	7	26	8	5	8	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
21.8	4	3	-	-	3	2	1	3	-	-	-	1	2	3	-	3	2	13	6	2	-	9	9	-	-	-	3	-	-	-	-	-	-	-	-	-	-
22.8	3	4	2	1	1	3	2	1	-	-	-	2	4	-	-	2	3	10	3	1	2	3	3	3	4	2	3	2	2	4	2	3	-	2	3	-	2
23.9	2	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	1	-	-	-	4	5	-	-	1	4	3	-	-	4	2	3	-	-	-	-
24.7	4	-	3	1	3	5	1	2	-	4	-	-	-	-	5	10	2	-	-	-	10	4	4	5	2	-	4	2	3	3	4	2	1	-	-	-	
25.8	5	4	3	4	4	3	2	3	3	5	2	1	3	2	1	5	8	6	-	-	-	14	2	10	9	6	4	3	3	2	2	3	1	2	2	1	
27.9a	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
28.7	3	3	3	-	-	-	3	2	1	-	-	9	-	-	9	9	7	-	-	5	2	-	-	-	-	-	5	4	3	4	2	-	-	-	-	-	-

Note: Observation low weight: Feb. 21.8 at S55°- S65°; Feb. 22.8 at N65° - N70°; Feb. 24.7 at N65° - N75°;  
Feb. 25.8 at N65° - N75°; Feb. 28.7 at S05° - S65°.

Table 62b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date GCT	Degrees south of the solar equator										0°	Degree north of the solar equator																									
	90	85	80	75	70	65	60	55	50	45		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90								
1950																																					
Feb. 1.7a	4	3	2	2	3	3	5	6	7	10	10	11	12	14	13	15	32	31	18	27	33	42	48	46	42	36	36	37	22	17	14	12	6	5	8	8	5
*2.9a	-	-	2	3	4	3	3	4	5	5	7	6	5	10	9	16	25	27	33	32	35	47	44	54	41	40	35	26	19	14	12	11	10	4	5	2	2
*3.7a	-	-	5	3	4	3	3	4	3	4	5	4	13	12	14	25	28	26	25	28	48	47	48	43	40	34	30	17	15	9	13	5	4	6	3	3	
4.7a	4	6	6	4	6	3	5	4	5	11	13	14	19	23	28	32	36	35	35	42	44	53	60	57	53	52	49	51	49	44	32	15	9	8	6	3	
5.9a	3	4	6	-	4	4	5	7	9	8	9	14	14	10	15	25	32	26	19	17	20	34	40	40	42	42	41	36	23	15	11	8	4	5	3	4	
6.8a	4	3	-	-	3	5	5	5	6	12	12	10	13	15	18	37	30	26	17	13	17	36	41	43	39	38	37	25	17	13	7	4	5	3	3		
7.7a	4	3	4	3	-	-	5	5	6	11	14	15	13	17	27	27	43	40	32	28	21	33	42	43	44	37	37	38	27	18	10	9	2	2	2		
8.9	2	1	2	-	-	-	2	6	5	9	9	13	13	28	30	28	26	16	19	22	23	28	31	22	18	17	14	11	3	2	4	3	2	1			
14.9	-	-	-	-	-	-	-	-	2	4	5	10	12	13	13	14	19	23	29	24	17	12	10	10	4	-	-	-	-	-	-	-					
15.9	-	-	-	-	-	-	-	-	4	8	10	11	11	12	14	16	22	20	25	13	14	12	12	7	-	-	-	-	-	-	-	-	-				
16.9	-	2	2	-	-	-	-	-	-	7	9	10	12	13	14	16	16	17	15	16	17	17	13	9	4	-	-	-	-	-	-	-	-				
17.9	3	2	-	-	-	2	2	2	1	4	7	9	10	14	14	18	16	13	13	15	17	15	23	17	15	10	7	3	-	-	3	2	2				
18.9	-	-	-	-	-	-	-	-	3	4	5	3	9	13	14	15	14	13	13	13	16	19	15	10	6	2	-	2	3	2	2						
21.8	-	1	-	3	2	4	4	4	5	6	9	10	13	20	27	30	31	28	13	14	18	20	22	16	13	12	11	10	7	8	5	3	2				
22.8	-	2	3	-	1	3	4	3	6	9	8	11	12	13	29	24	21	15	13	20	17	19	19	12	10	10	12	9	12	9	8	5	3	2			
23.9	-	-	-	-	-	3	4	3	3	4	9	7	8	13	14	14	14	9	12	14	10	12	16	8	5	4	9	10	9	6	2	3	-				
24.7	-	-	-	-	-	4	3	3	9	7	10	8	8	13	16	16	13	12	20	27	23	26	13	12	10	9	10	11	10	8	5	4	3				
25.8	-	-	2	2	4	3	6	5	4	10	11	9	8	12	20	15	14	17	30	33	31	40	36	29	26	20	12	9	8	8	4	3	2				
27.9a	-	-	-	-	-	2	5	3	-	-	3	3	5	7	10	11	13	10	9	14	24	28	22	18	15	12	19	8	7	5	4	3	-				
28.7	-	1	1	-	3	4	7	5	4	5	2	4	3	8	8	11	12	10	9	12	21	25	25	30	22	16	11	7	7	8	8	4	3	5	4	2	2

Table 63b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Date GCT	Degrees south of the solar equator										0°	Degree north of the solar equator																									
	90	85	80	75	70	65	60	55	50	45		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90								
1950																																					
Feb. 1.7a	2	3	-	4	4	3	4	3	-	-	-	3	8	7	5	9	15	24	37	14	17	12	17	8	-	4	4	4	5	6	5	13	11				
*2.9a	2	-	-	2	4	4	4	6	-	-	2	2	3	7	3	3	11	3	8	30	18	42	27	15	9	2	-	-	-	1	4	5	11	X			
*3.7a	5	4	3	5	3	3	5	5	5	3	3	3	4	2	3	4	4	11	13	8	29	18	26	25	17	12	-	2	-	-	-	5	9	11	9		
4.7a	4	3	3	4	4	4	8	8	10	11	-	5	5	-	-	9	14	13	11	17	25	42	33	20	31	16	18	19	11	3	-	3	7	11	13	12	
5.9a	4	4	5	5	5	5	4	5	-	-	-	-	2	-	4	-	5	15	15	13	14	28	17	12	8	3	-	-	-	1	4	9	9	10			
6.8a	3	2	3	-	2	2	3	2	-	-	-	-	-	-	-	6	11	4	8	9	11	10	14	12	6	6	-	-	-	3	5	8	10	8			
7.7a	3	3	-	3	5	4	4	3	3	4	-	-	2	-	3	12	17	11	4	11	12	8	5	10	3	5	-	-	2	3	3	6	9	5	8		
8.9	3	-	-	3	3	2	1	2	-	-	-	3	2	5	7	11	3	6	3	6	-	5	3	2	3	2	-	-	3	2	2	3	4	3	9		
14.9	-	-	-	3	-	-	-	-	-	-	-	6	-	1	1	3	-	9	8	6	2	4	3	2	3	3	2	2	2	3	4	3	9				
15.9	-	-	-	-	-	3	3	1	-	-	3	-	-	1	2	3	7	14	9	4	3	2	-	3	1	3	3	3	3	4	3	1	1				
16.9	-	2	3	1	2	2	2	-	-	-	-	-	3	4	5	7	7	10	10	9	4	3	2	-	-	2	3	3	3	3	4	3	4				
17.9	-	-	-	-	-	-	-	-	-	-	-	6	7	3	7	11	4	18	6	8	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-		
18.9	-	-	-	-	-	-	-	-	-	-	-	2	3	5	4	3	5	4	14	7	12	3	4	3	2	2	-	4	2	4	2	-	3	5			
21.8	-	-	1	1	2	2	3	-	-	-	-	-	7	10	11	3	4	2	-	4	8	4	2	-	-	2	2	1	1	1	1	2	4	4			
22.8	2	2	-	-	-	3	3	2	-	-	-	-	2	14	15	9	10	2	3	-	11	2	7	2	-	-	1	-	-	-	-	-	-	-	-		
23.9	-	-	-	-	-	-	-	-	-	-	-	-	6	10	4	-	-	7	8	7	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24.7	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	3	1	6	9	10	13	12	4	3	-	2	-	-	-	-	-	-	-	-	-	-	
25.8	-	1	3	3	2	2	1	1	1	-	-	4	13	3	5	9	5	10	15	22	17	6	7	3	2	-	-	3	-	-	-	-	4	5	4		
27.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	13	13	6	2	1	-	-	-	-	-	-	-	-	-	-	4	5	5
28.7	2	3	-	-	-	-	-	-	-	-	-	-	2	8	4	1	3	2	4	10	7	9	3	8	2	-	-	4	4	-	2	4	6	7	3		

Table 64a

Coronal observations at Sacramento Peak, New Mexico (6704A), east limb

Date GCT	Degrees north of the solar equator															0°	Degrees south of the solar equator																			
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	4	4	5	3	3	3	2	2	2	1	2	2	2	1	-	-	-	-	
Feb. 1.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	2	1	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-		
2.9a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	5	5	4	2	1	1	1	-	-	1	-	-	-	-	-	-		
4.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	3	4	3	2	-	-	2	1	-	-	-	-	-	-	-	-		
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	2	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	
7.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	3	3	2	-	-	2	3	2	-	1	-	-	-	1	2	2	2		
8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-		
14.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	1	-	3	4	3	-	-	-	-	-	-	-	-	-	-	1		
15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	2	6	4	2	-	-	-	-	-	-	-	-	-		
16.9	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	2	5	3	2	2	-	-	-	1	1	1	1	1	-	-	-	-	-		
17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	5	3	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-		
18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	6	3	3	2	2	3	2	1	-	-	-	-	-	-	-	-	-		
21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	1	-	-	-	2	1	-	-	-	-	-	-	-	-	-	
22.8	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
23.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	1	2	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Observation low weight: Feb. 21.8 at 850° - 870°; Feb. 28.7 at 805° - 870°.

Table 64b

Coronal observations at Sacramento Peak, New Mexico (6704A), west limb

Date GGT	Degrees south of the solar equator													0°	Degrees north of the solar equator																		
	90	85	80	75	70	65	60	55	50	45	40	35	30		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
1950	-	1	1	-	2	-	-	2	-	3	1	-	3	3	2	2	3	2	2	5	6	10	9	7	6	3	2	2	3	-	-	-	
Feb. 1.7a	-	-	-	-	1	1	1	1	1	1	2	3	3	3	3	4	3	3	3	5	7	9	8	7	4	6	3	2	2	3	-	2	-
*2.9a	-	-	-	-	-	-	-	-	-	-	1	1	1	1	3	2	2	3	8	11	12	10	7	5	4	3	2	3	1	-	-	X	
*3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6.8a	-	-	-	-	-	-	-	-	-	-	2	2	2	3	1	1	3	2	2	4	5	8	5	5	4	3	2	2	-	-	-		
7.7a	-	-	-	-	-	-	-	-	-	-	2	2	2	3	4	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	-	
8.9	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-		
14.9	1	-	-	-	-	-	-	1	-	-	-	1	2	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-		
15.9	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
16.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
17.9	-	-	-	-	-	-	-	-	-	-	2	3	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1	2	3	2	-	-	-	-	-	-	-	-		
21.8	-	-	-	-	-	-	-	1	-	-	1	2	1	1	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-		
22.8	-	-	-	-	-	-	-	1	1	-	-	2	2	2	1	1	1	-	-	-	-	-	1	-	-	-	2	1	-	-	-		
23.9	-	-	-	-	-	-	-	-	-	-	2	2	1	2	-	1	-	-	2	2	1	-	-	-	-	-	-	-	-	-	-		
24.7	-	-	-	-	-	-	-	2	1	2	1	1	4	2	2	1	-	-	-	3	-	-	-	-	-	-	-	-	-	-			
25.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	4	3	3	3	2	2	-	-	-	-	-	-	-	-		
27.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	-	1	3	3	1	-	-	-	-	-	-	-		
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	2	3	-	-	-	-	-	-	-				

\*Intensity of yellow line (5694A) west limb:

Feb. 2.9 — 14 at N20°, 14 at N21°, 11 at N22°, 13 at N23°, 13 at N24°, 12 at N25°, 8 at N26°, 4 at N27°, 4 at N28°;  
Feb. 3.7 — 4 at N22°, 4 at N23°, 3 at N24°, 3 at N25°, 3 at N26°, 2 at N27°.

Table 65

Preliminary values of mean K-indices,  $K_w$ , from 34 Observatories;

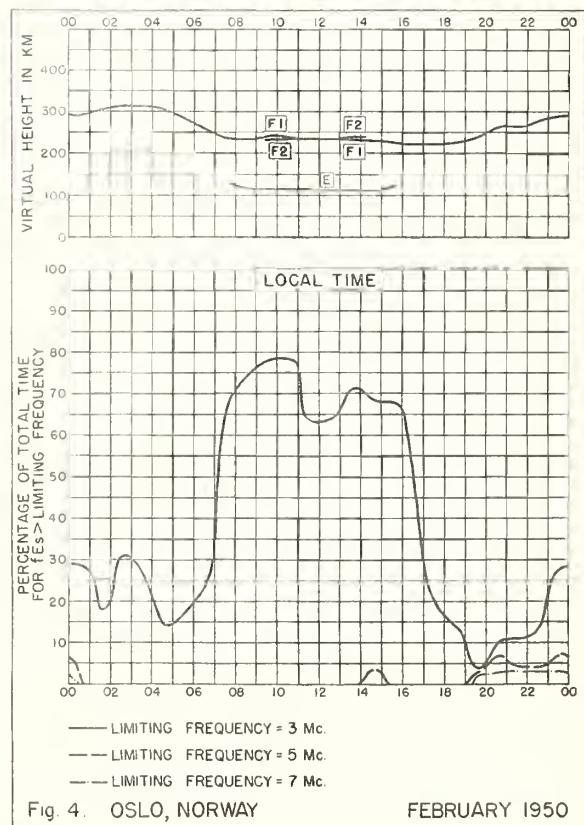
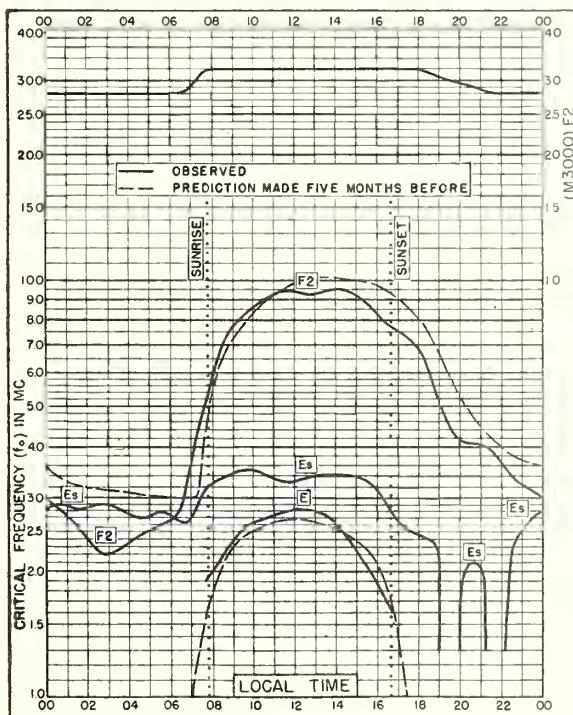
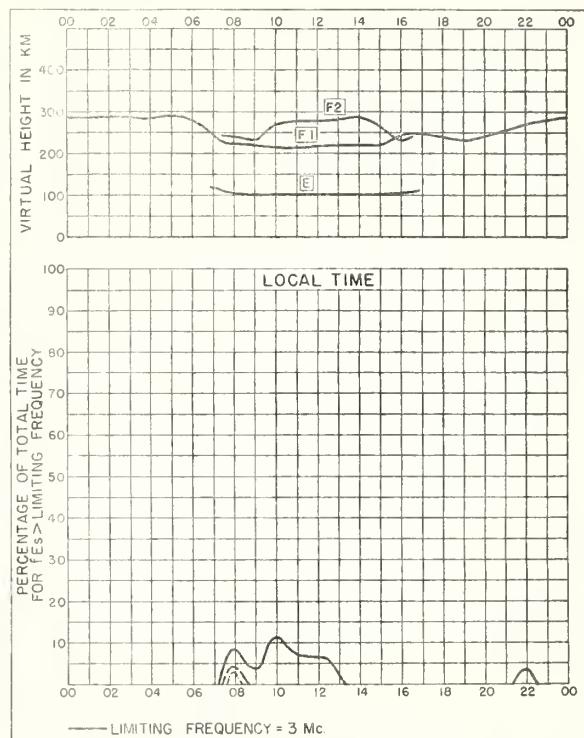
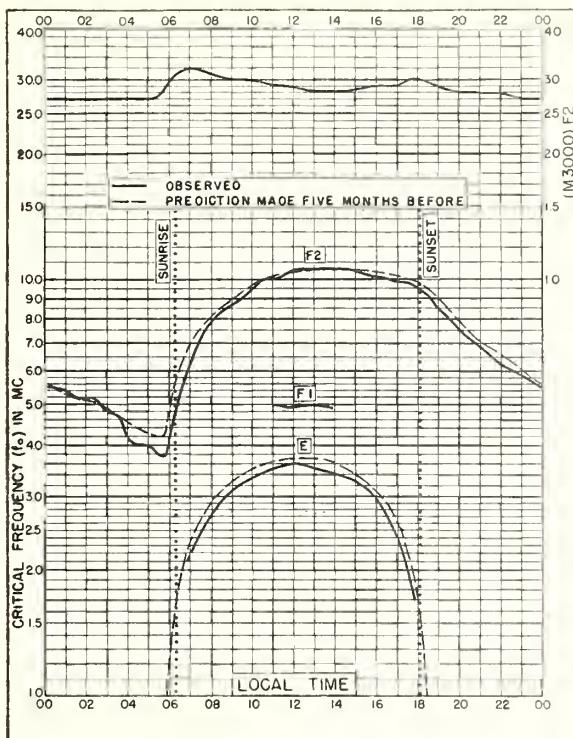
Preliminary values of International Character-Figures, C

## Geomagnetic planetary three-hour-range indices, Kp

Final magnetically selected days for February 1950

GRAPHS OF IONOSPHERIC DATA

45



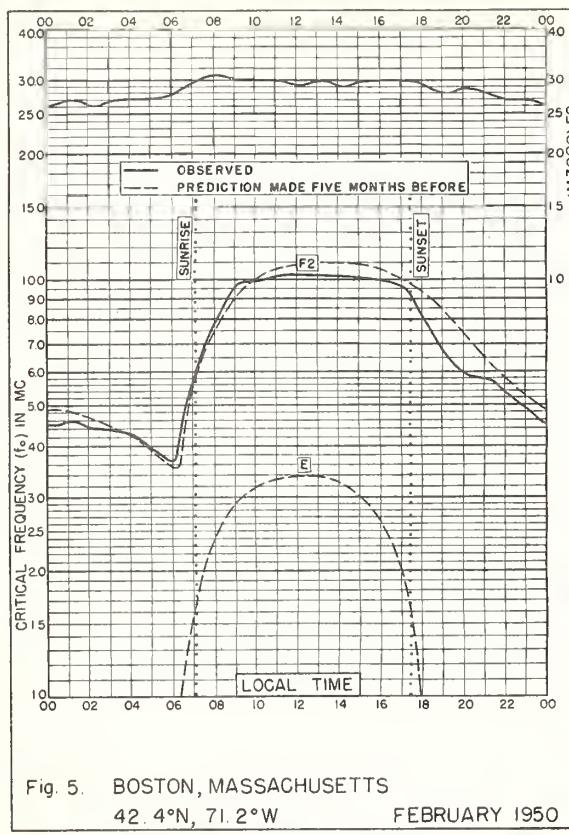


Fig. 5. BOSTON, MASSACHUSETTS  
42.4°N, 71.2°W FEBRUARY 1950

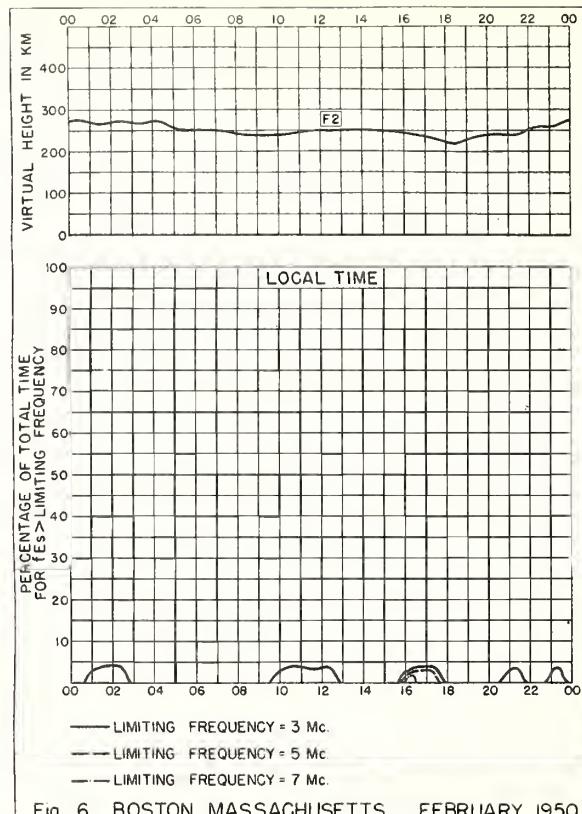


Fig. 6. BOSTON, MASSACHUSETTS FEBRUARY 1950

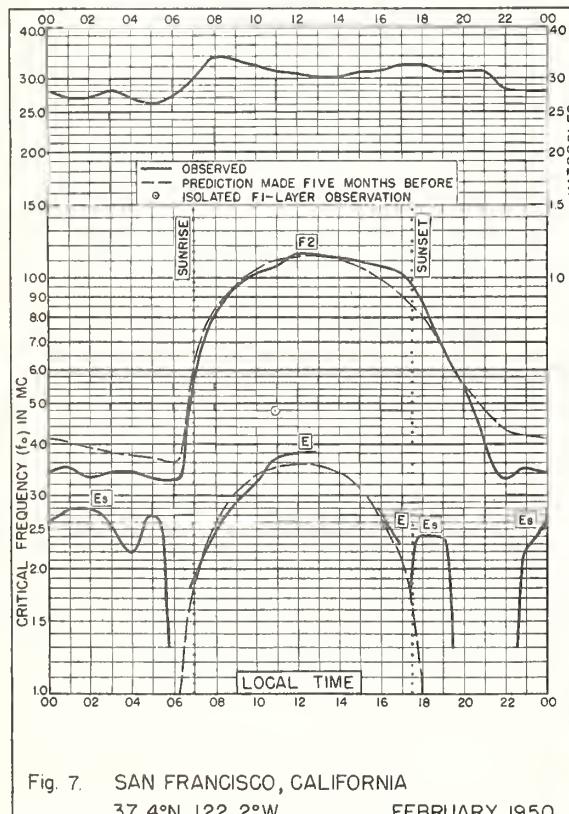


Fig. 7. SAN FRANCISCO, CALIFORNIA  
37.4°N, 122.2°W FEBRUARY 1950

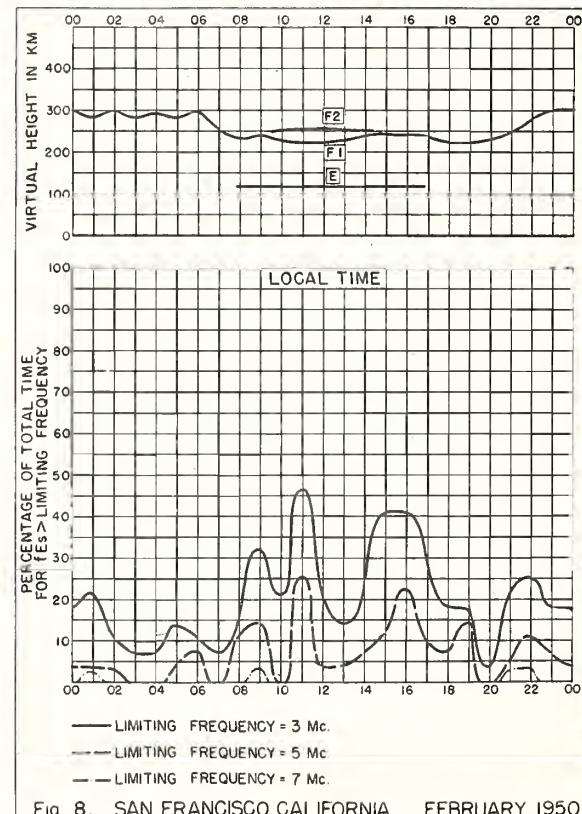
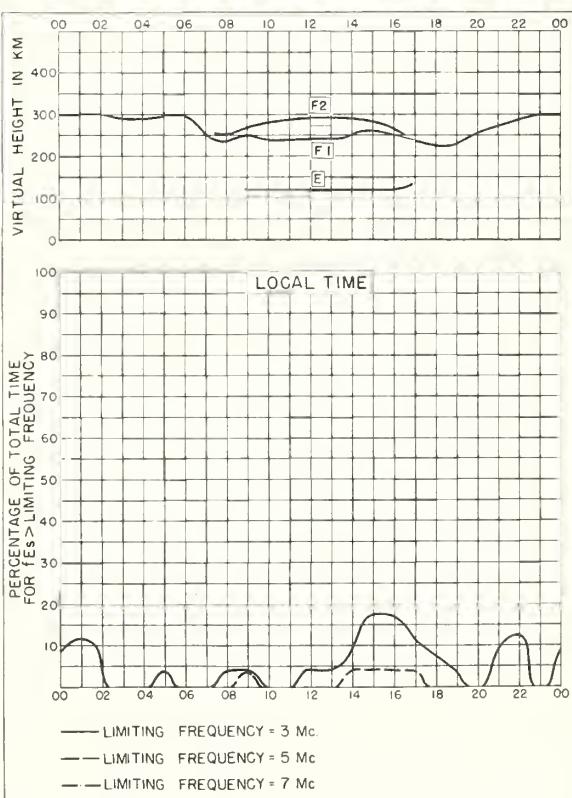
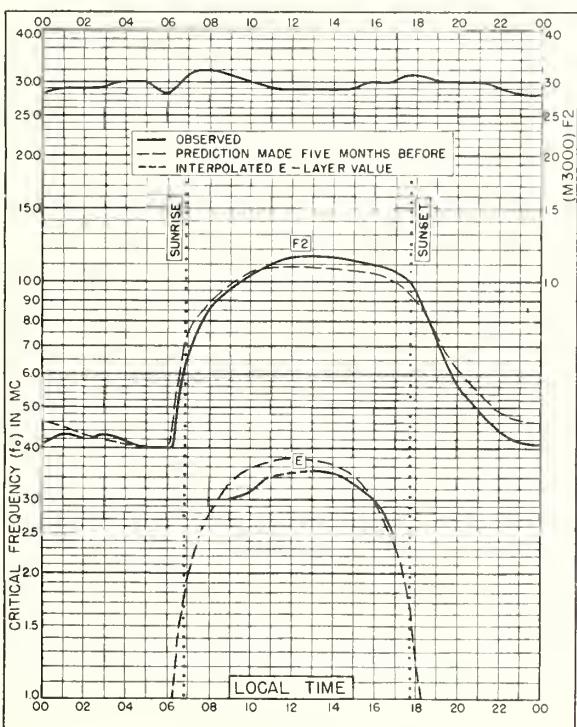
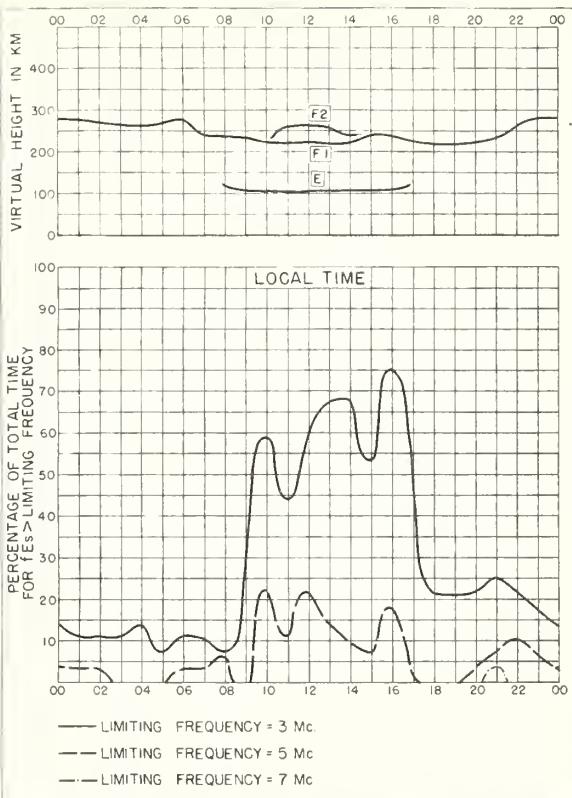
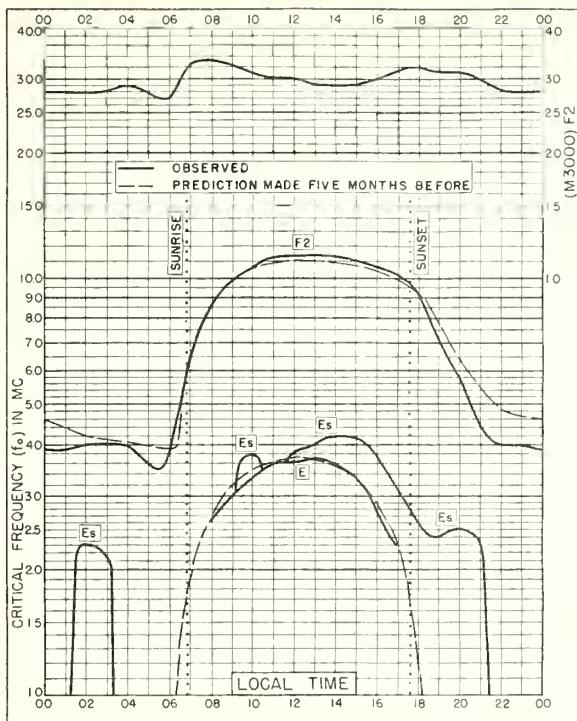
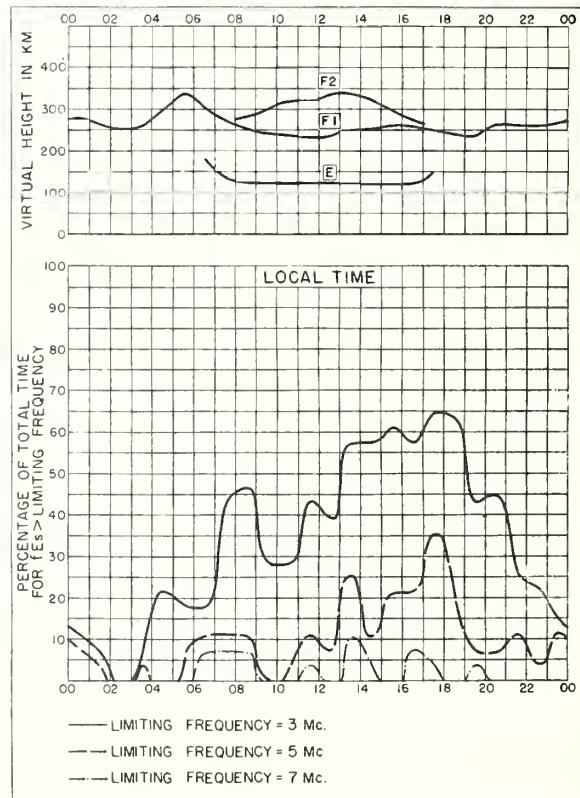
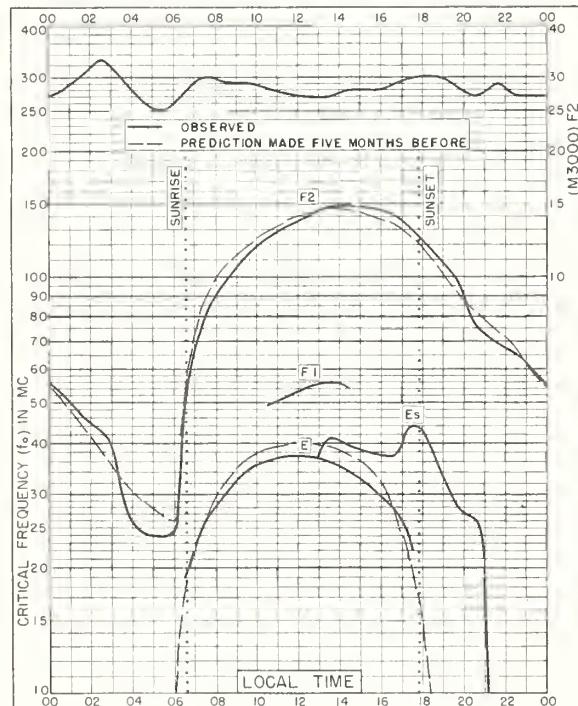
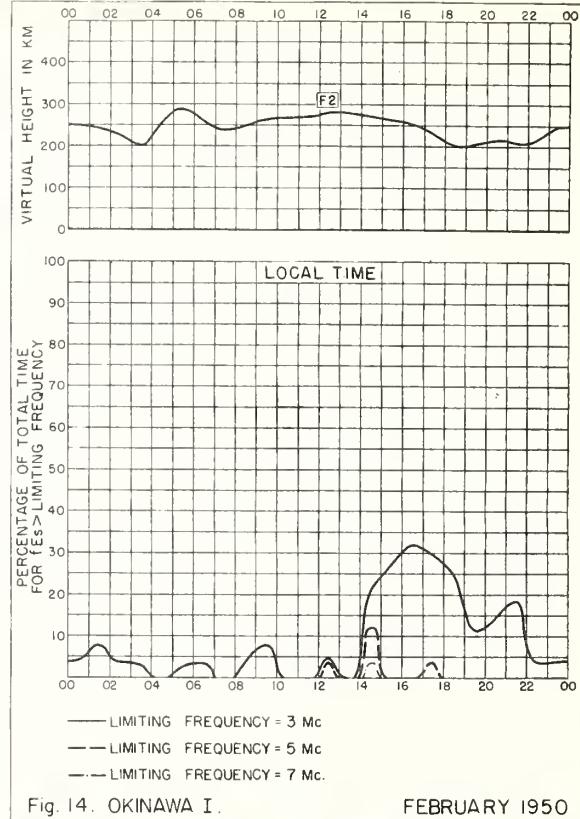
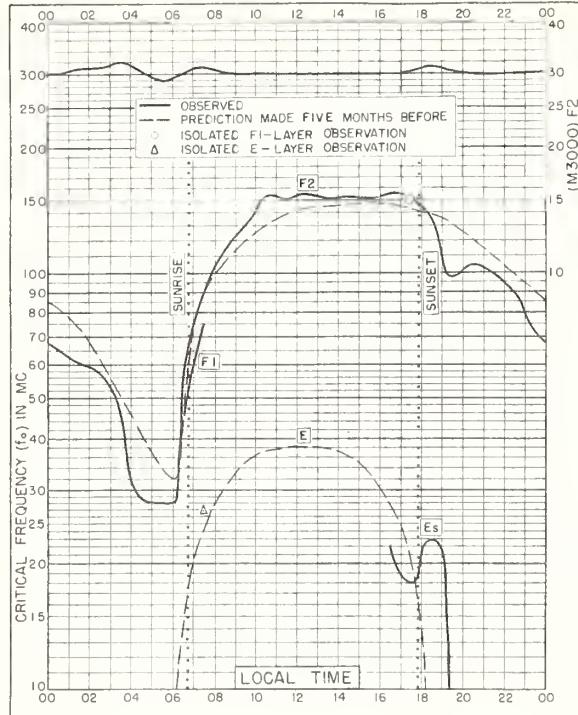
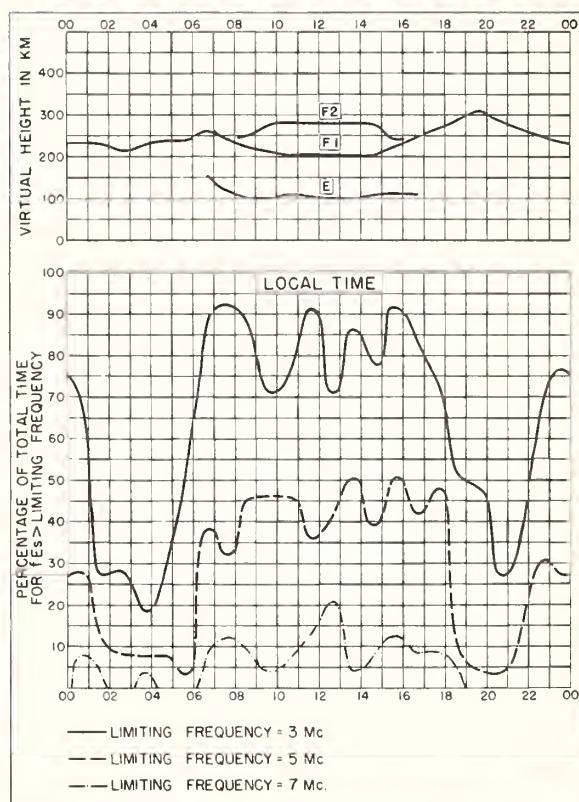
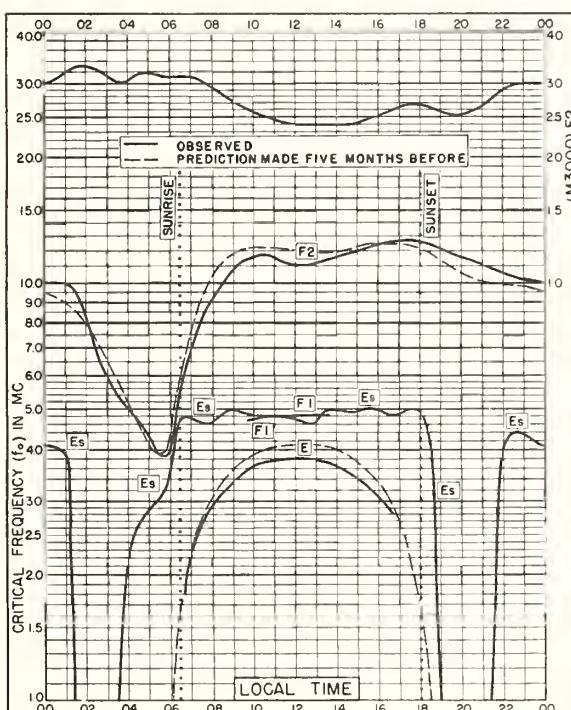
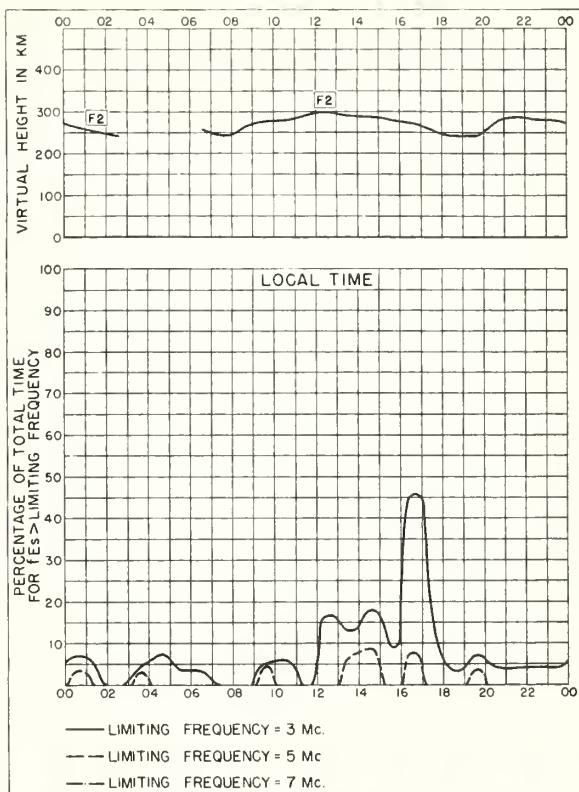
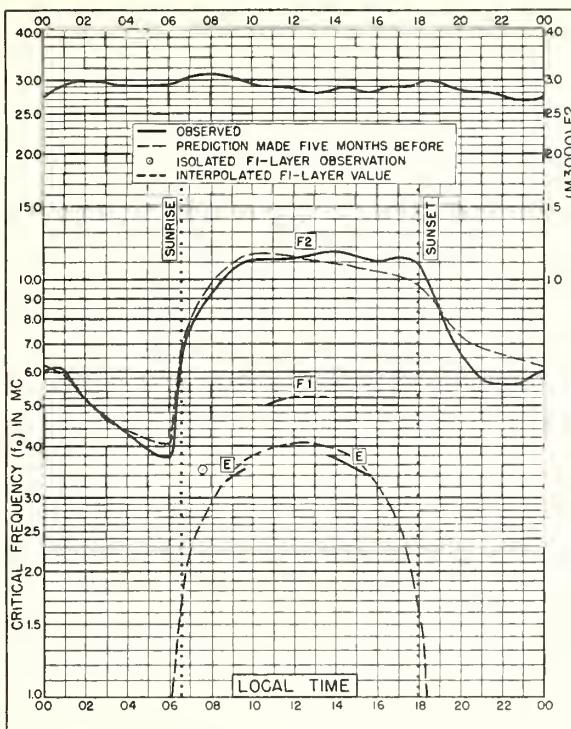


Fig. 8. SAN FRANCISCO, CALIFORNIA FEBRUARY 1950







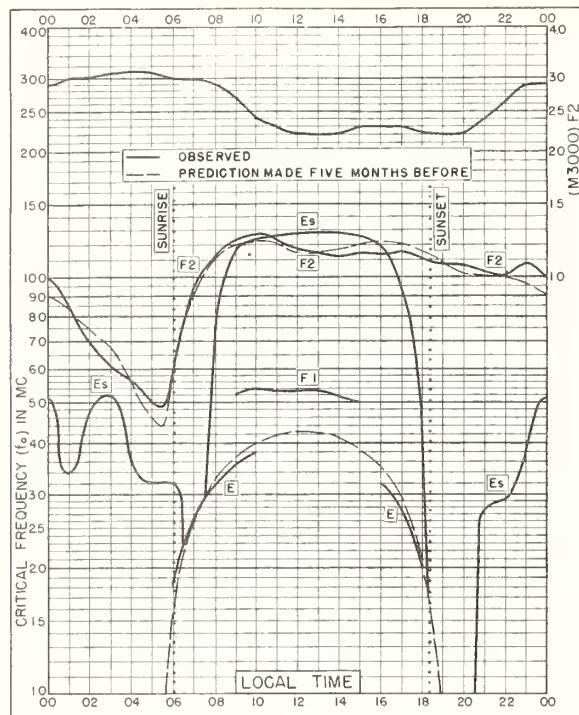


Fig. 21. HUANCAYO, PERU  
12.0°S, 75.3°W FEBRUARY 1950

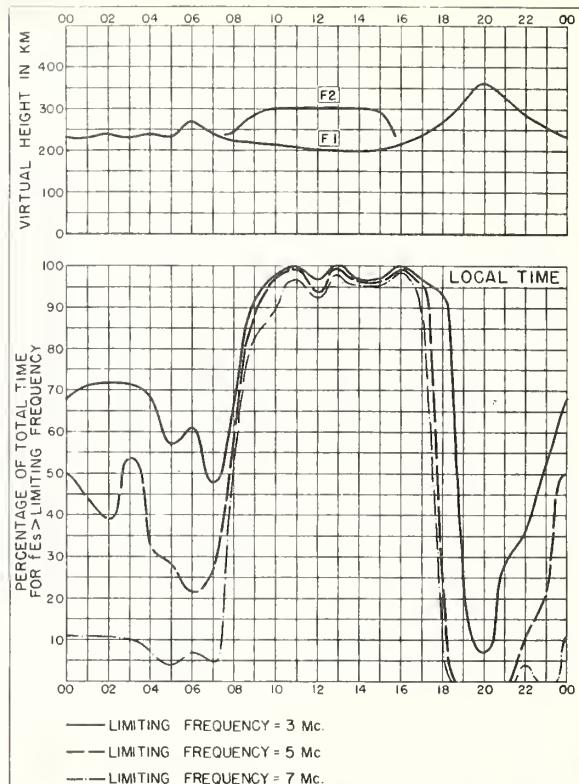


Fig. 22. HUANCAYO, PERU FEBRUARY 1950

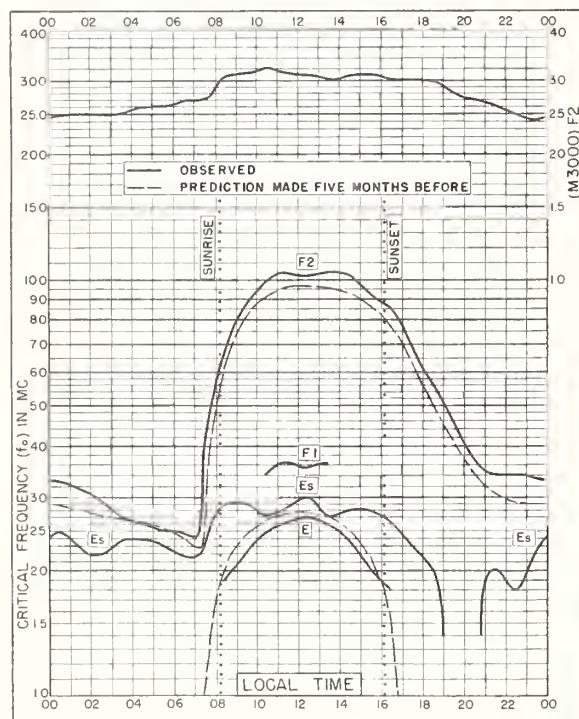


Fig. 23. De BILT, HOLLAND  
52.1°N, 5.2°E JANUARY 1950

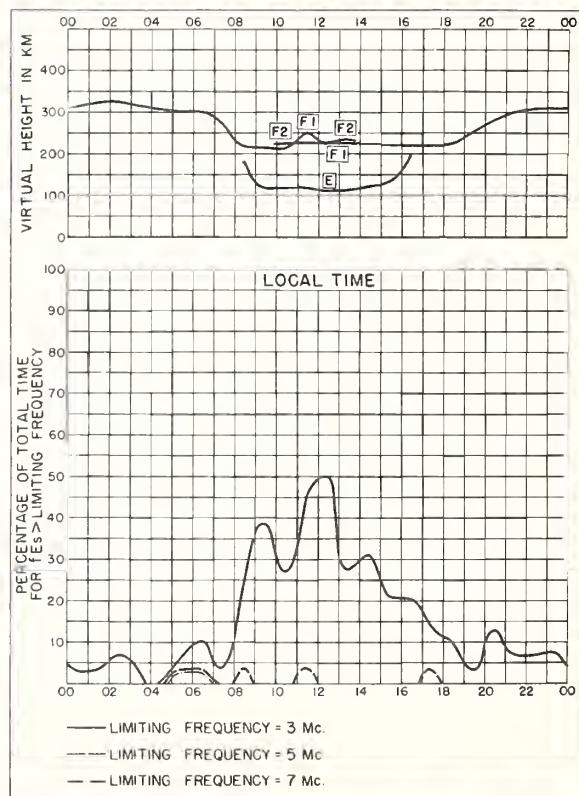
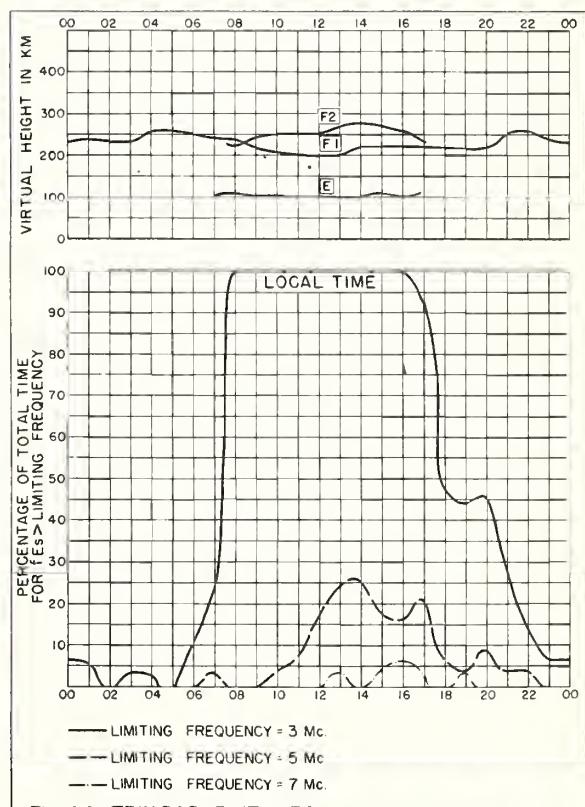
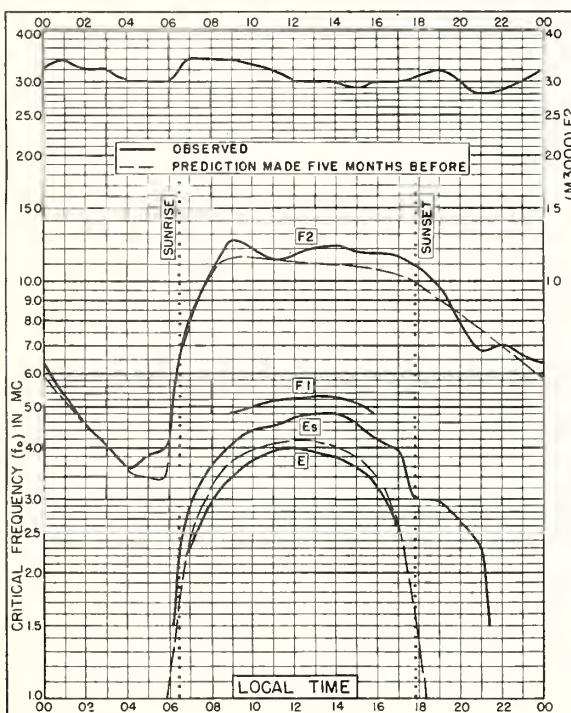
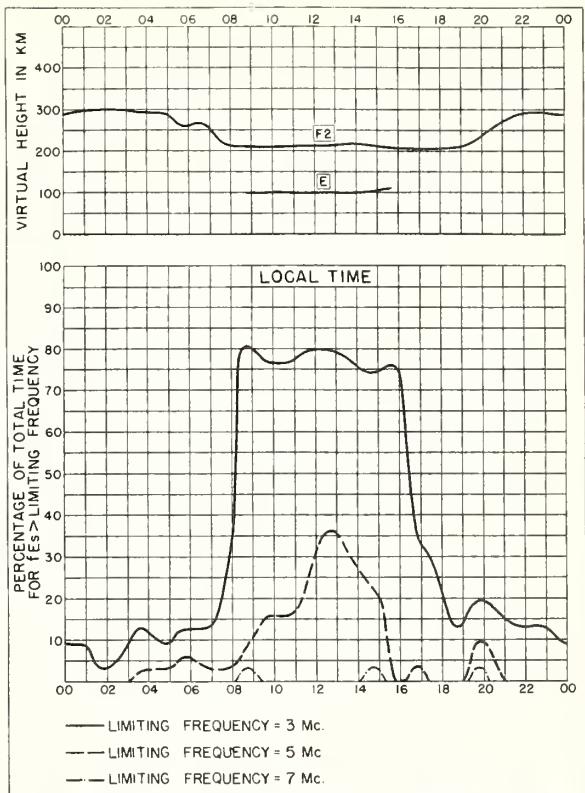
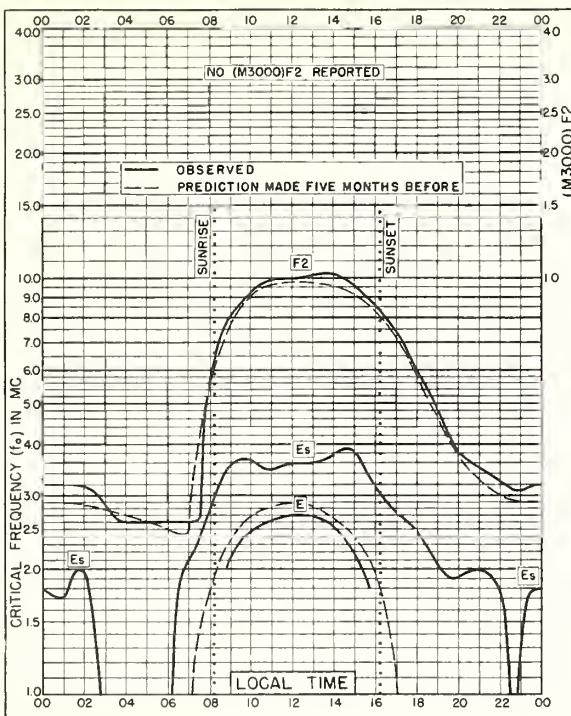


Fig. 24. De BILT, HOLLAND JANUARY 1950



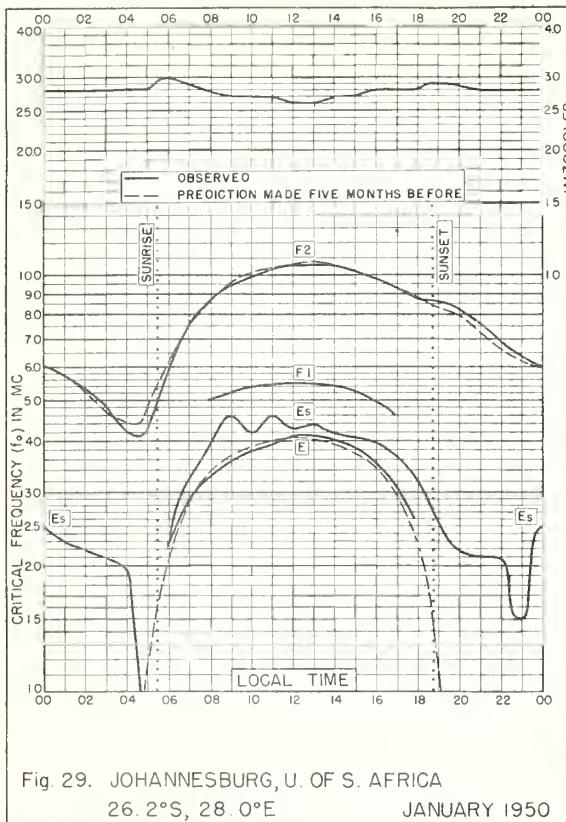


Fig. 29. JOHANNESBURG, U. OF S. AFRICA  
 26.2°S, 28.0°E JANUARY 1950

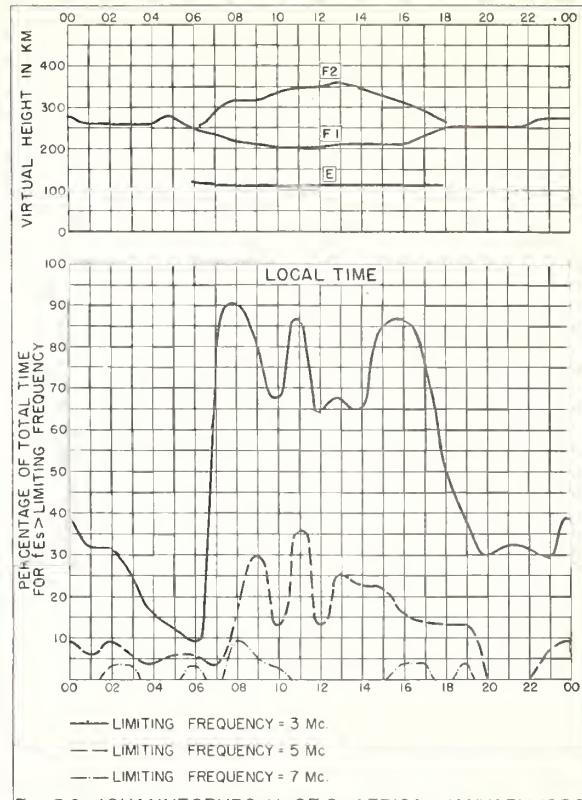


Fig. 30. JOHANNESBURG, U. OF S. AFRICA JANUARY 1950

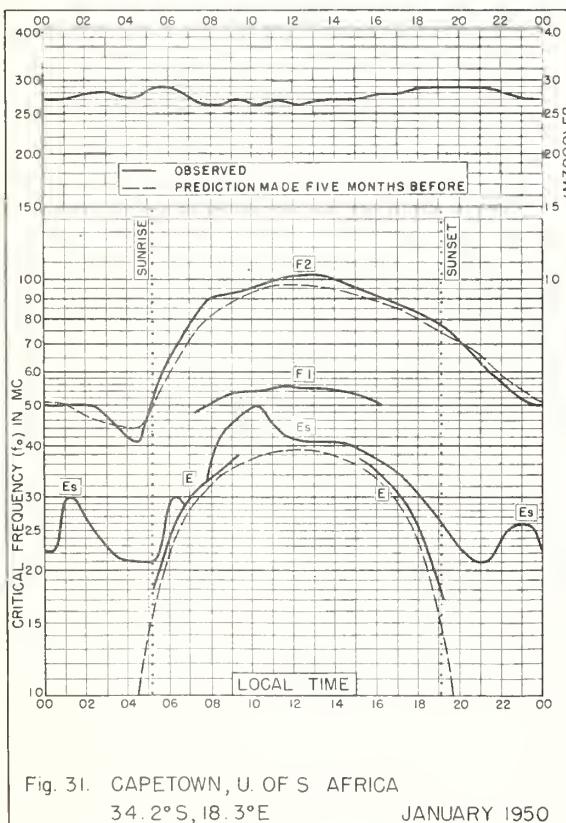


Fig. 31. CAPETOWN, U. OF S AFRICA  
 34.2°S, 18.3°E JANUARY 1950

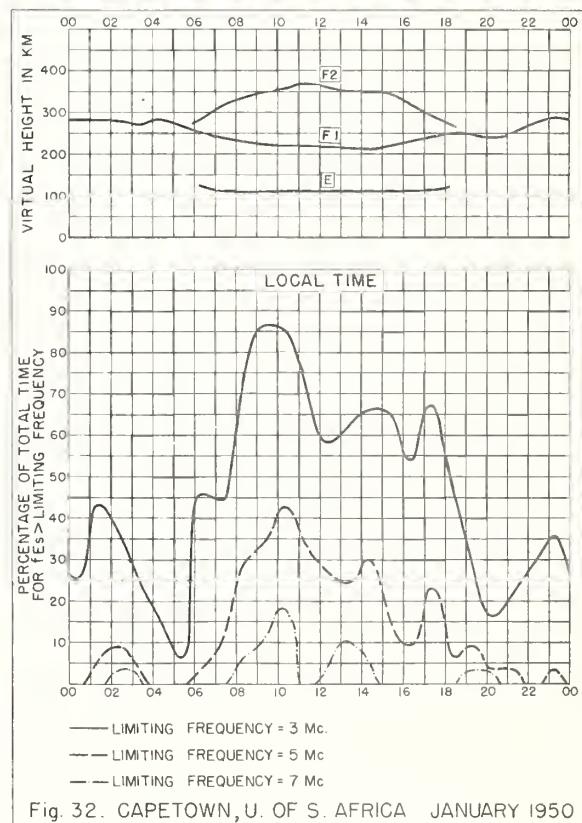


Fig. 32. CAPETOWN, U. OF S. AFRICA JANUARY 1950

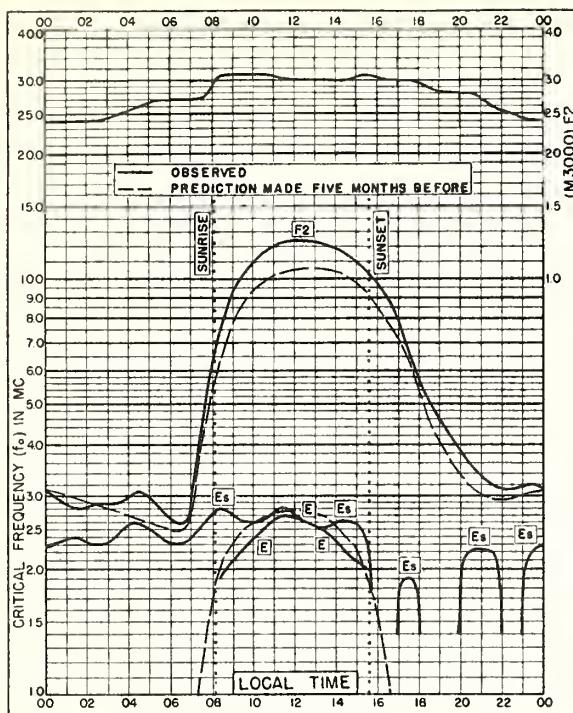


Fig. 33. De BILT, HOLLAND  
52.1°N, 5.2°E DECEMBER 1949

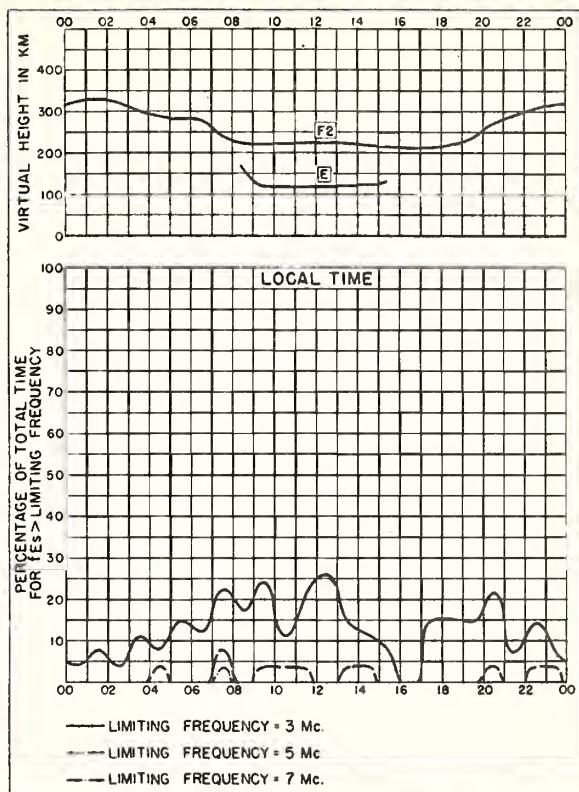


Fig. 34. De BILT, HOLLAND DECEMBER 1949

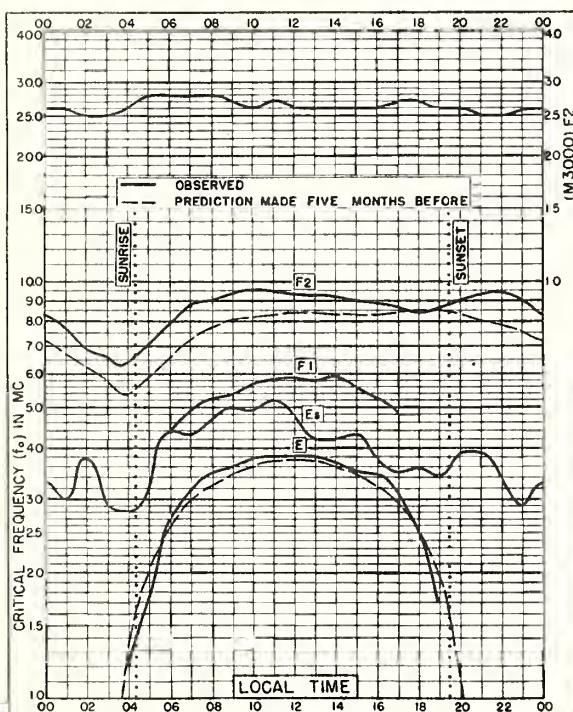


Fig. 35. CHRISTCHURCH, N. Z.  
43.5°S, 172.7°E DECEMBER 1949

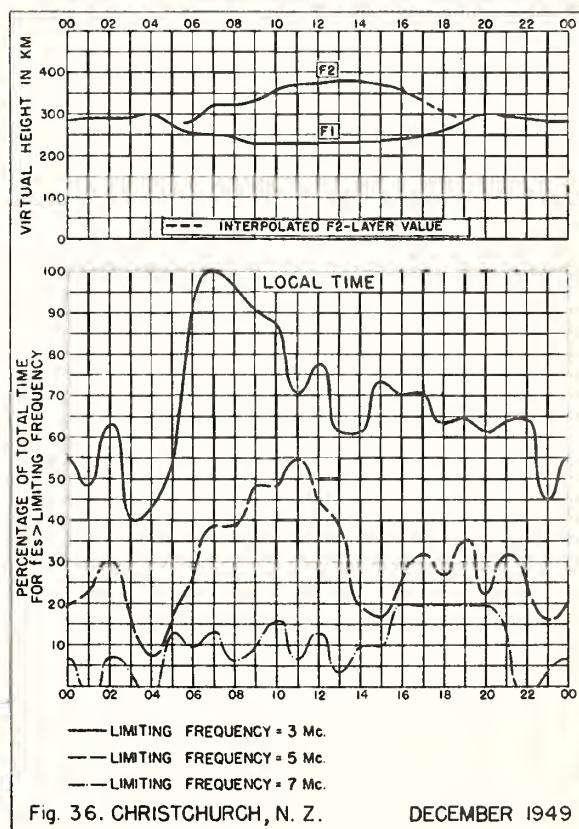


Fig. 36. CHRISTCHURCH, N. Z. DECEMBER 1949

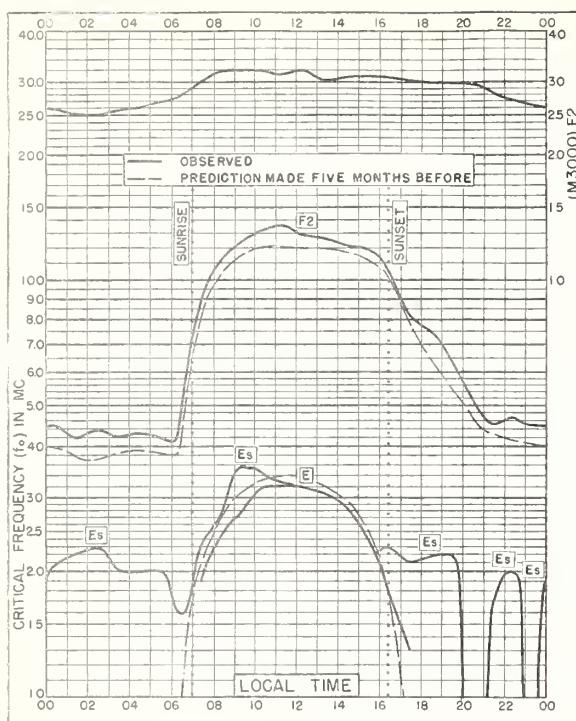


Fig. 37. WAKKANAI, JAPAN

45.4°N, 141.7°E

NOVEMBER 1949

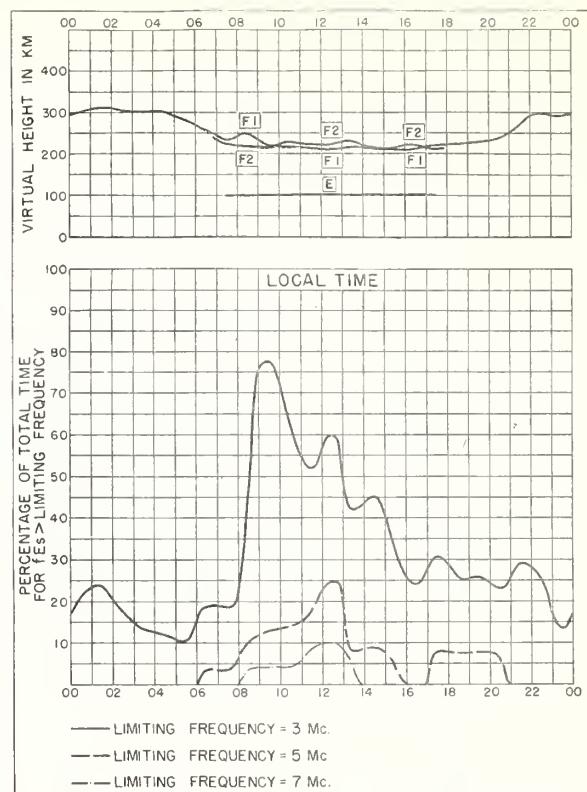


Fig. 38. WAKKANAI, JAPAN

NOVEMBER 1949

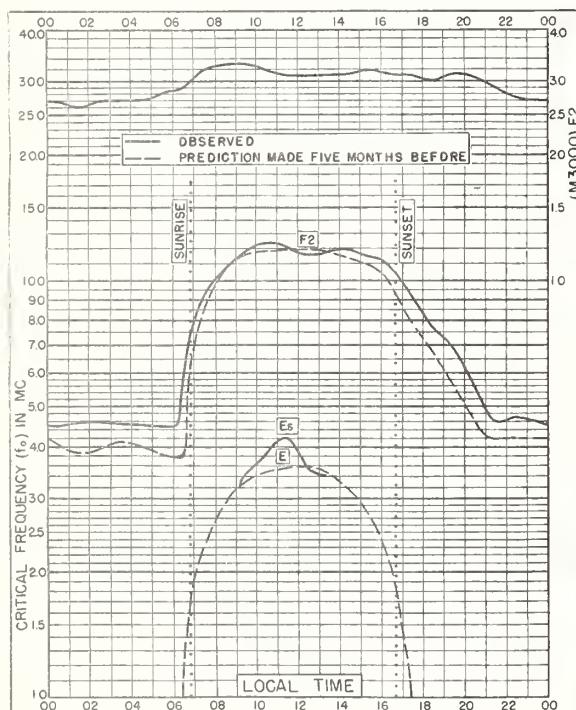


Fig. 39. FUKAURA, JAPAN

40.6°N, 139.9°E

NOVEMBER 1949

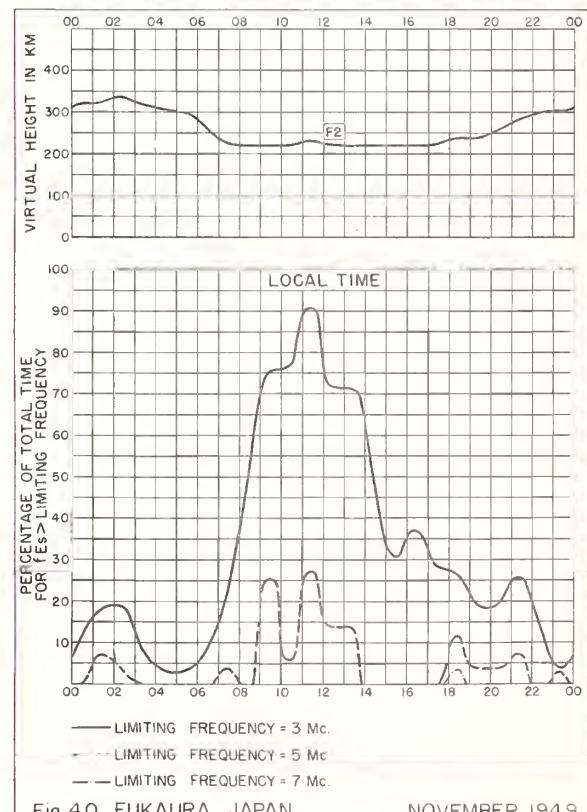
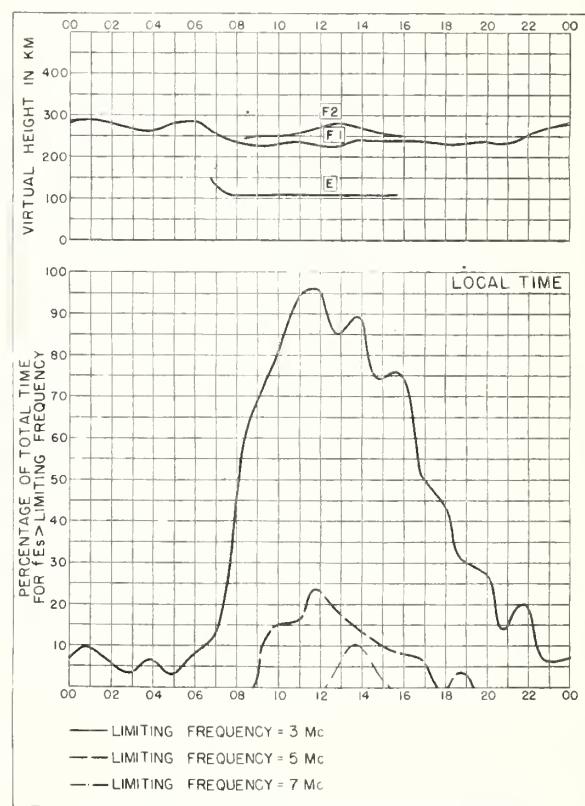
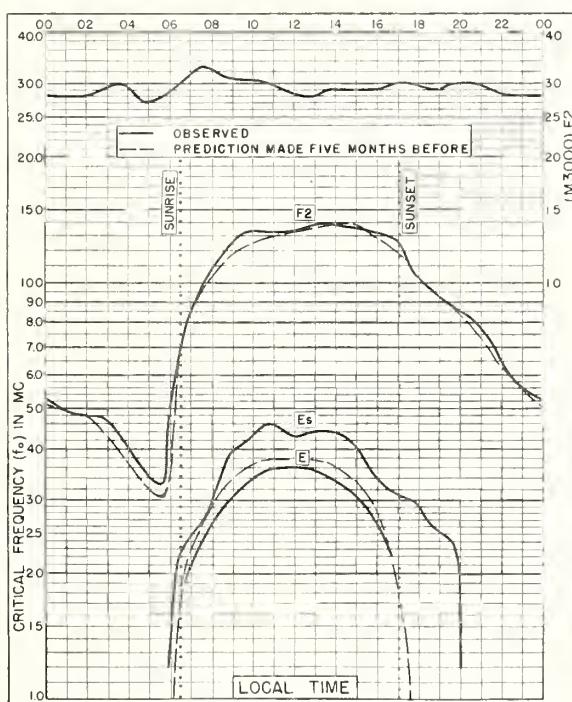
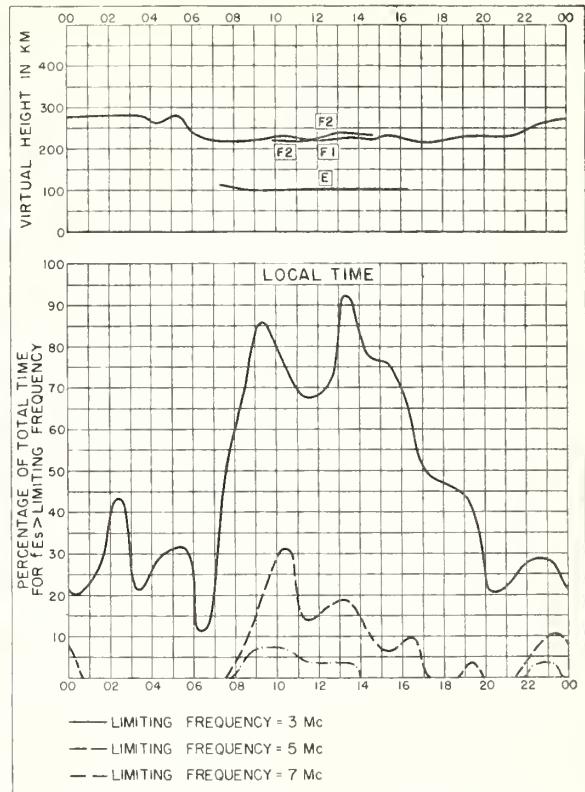
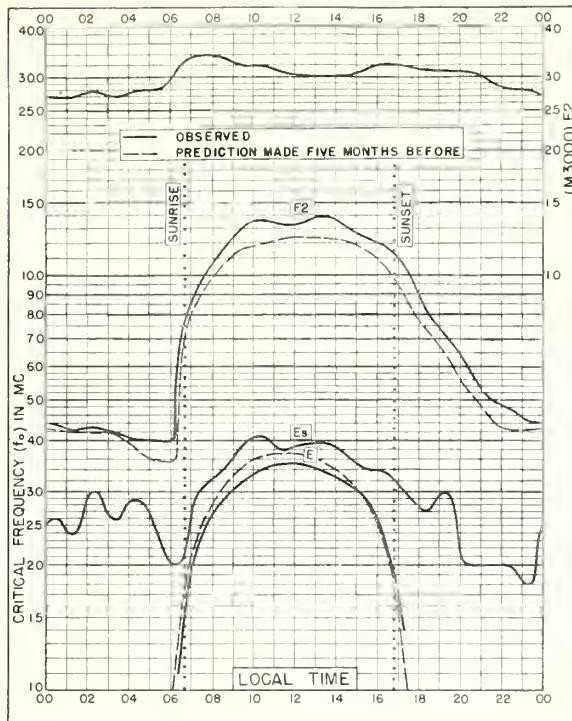
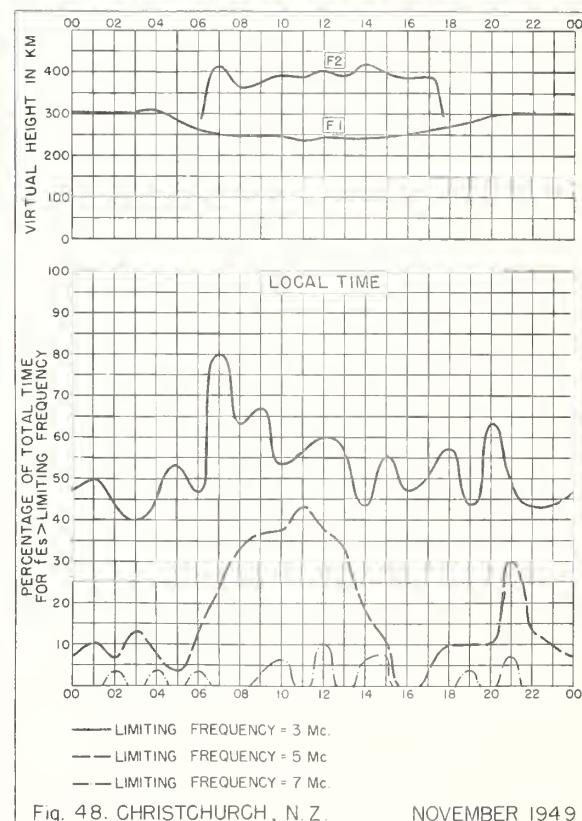
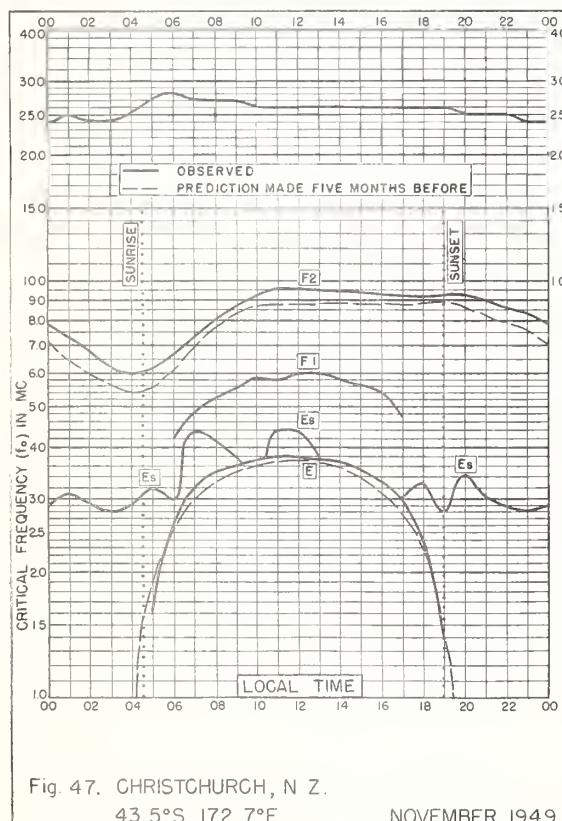
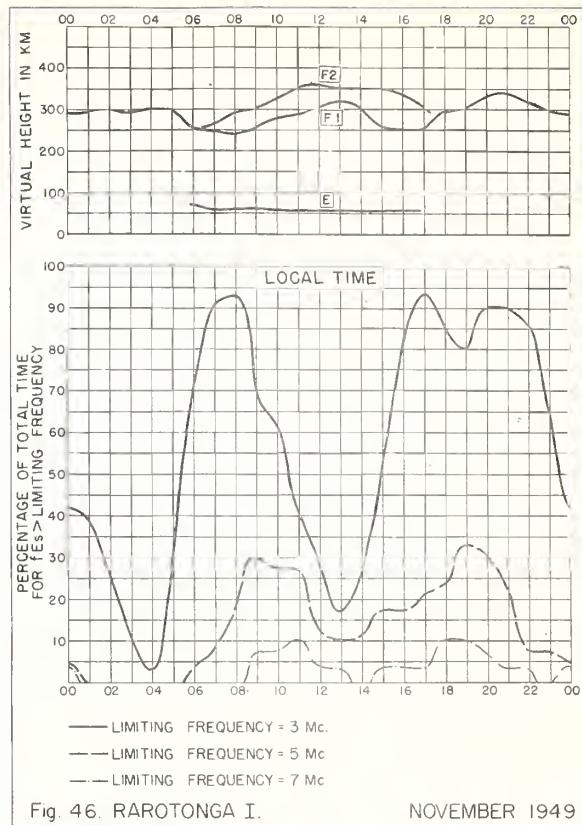
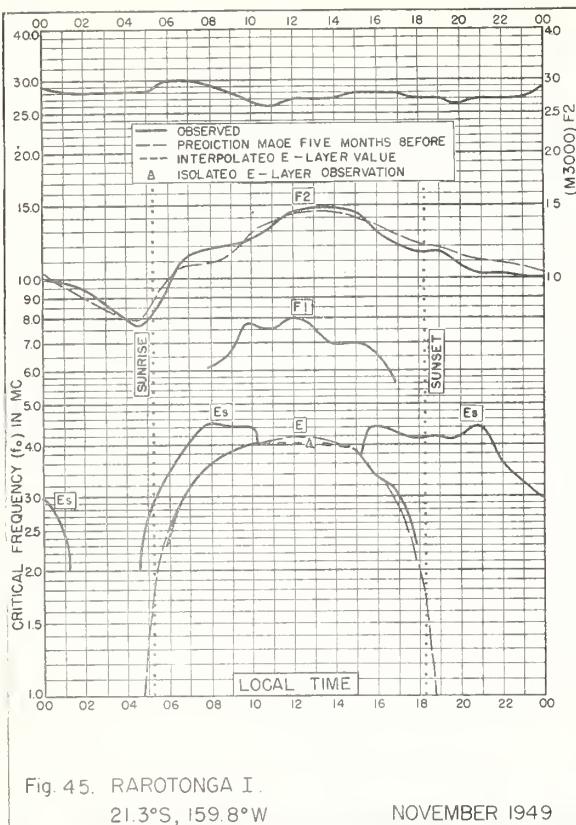
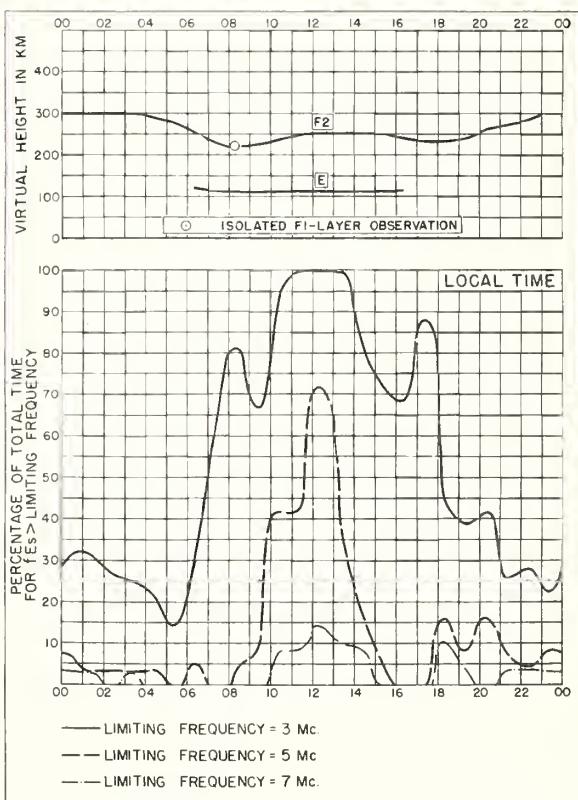
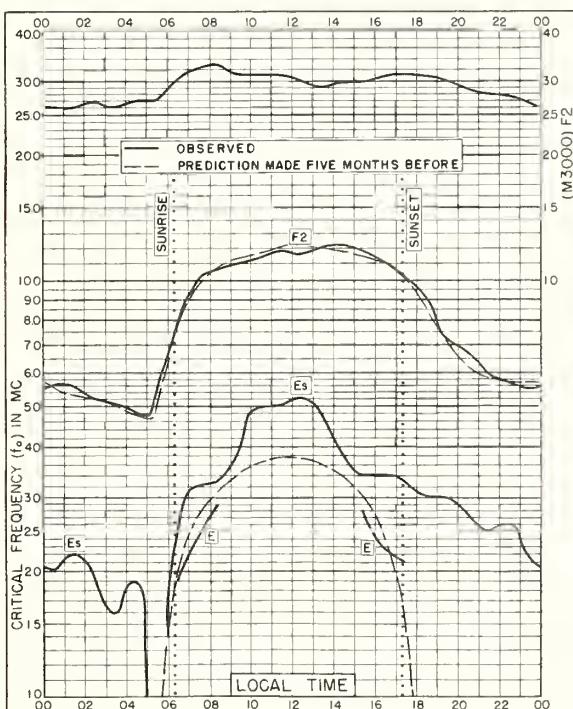
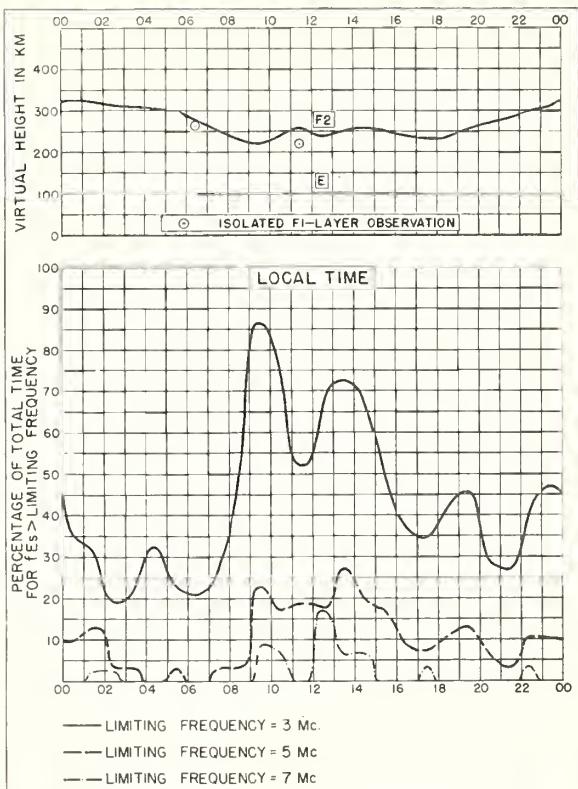
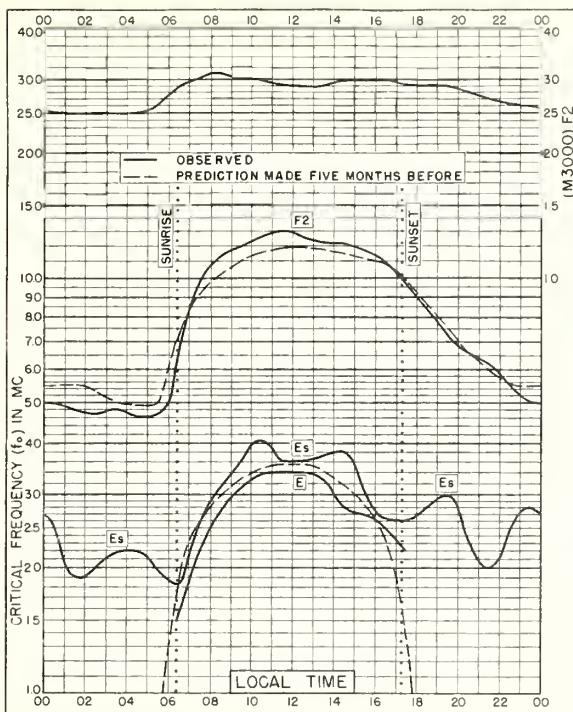


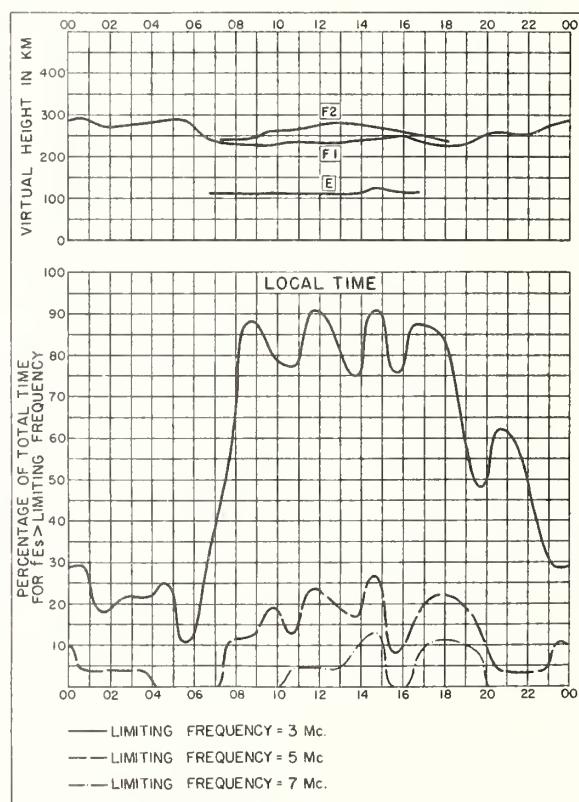
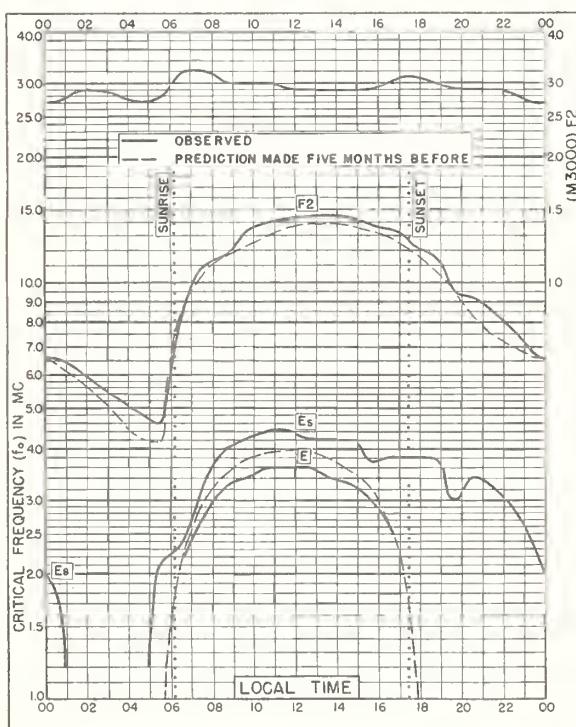
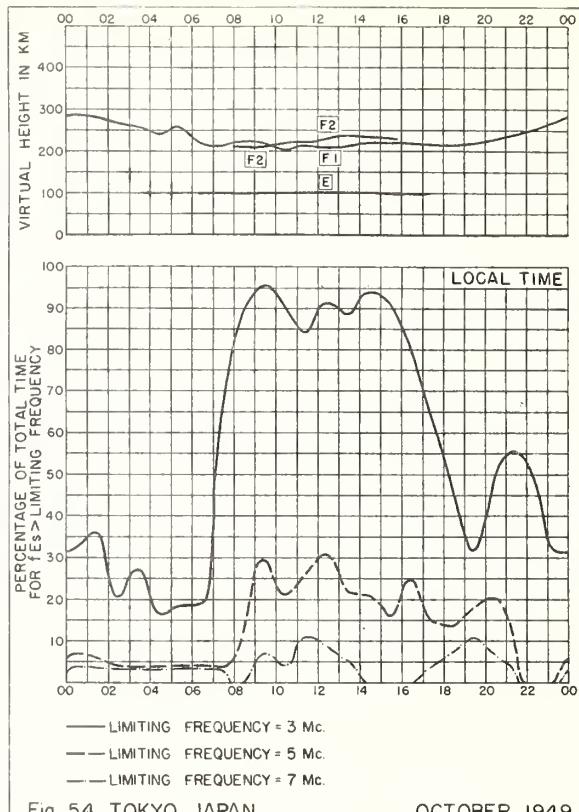
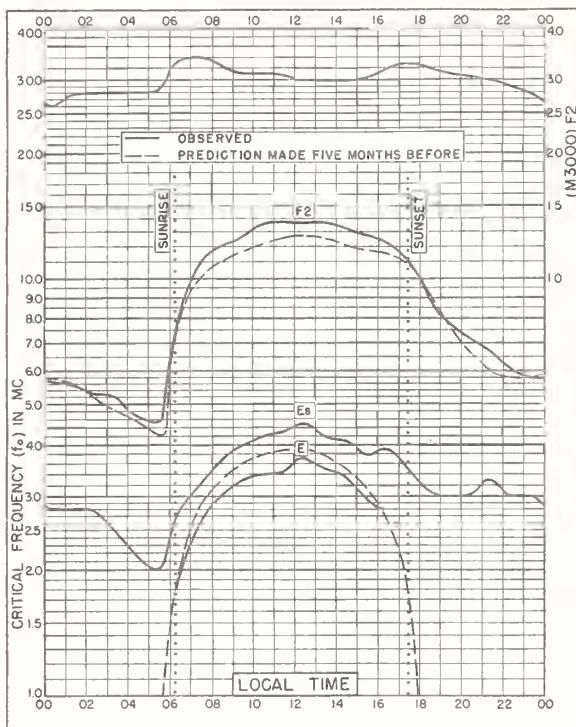
Fig. 40. FUKAURA, JAPAN

NOVEMBER 1949









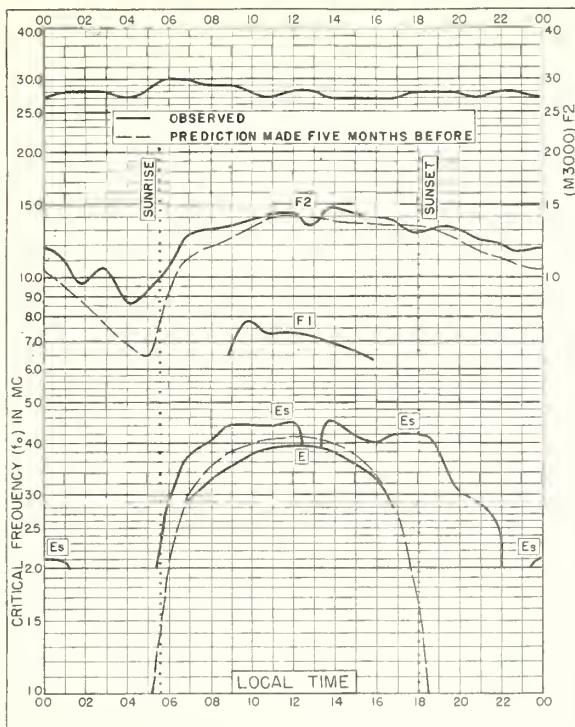


Fig. 57. RAROTONGA I.

21.3°S, 159.8°W

OCTOBER 1949

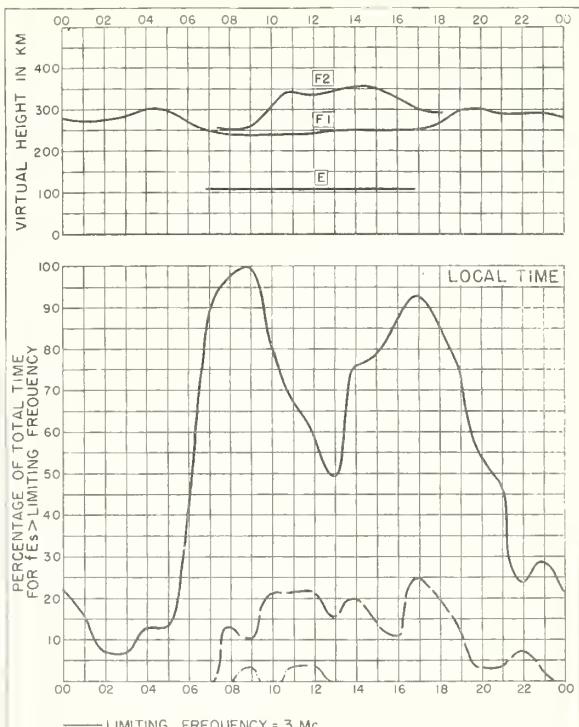


Fig. 58. RAROTONGA I.

OCTOBER 1949

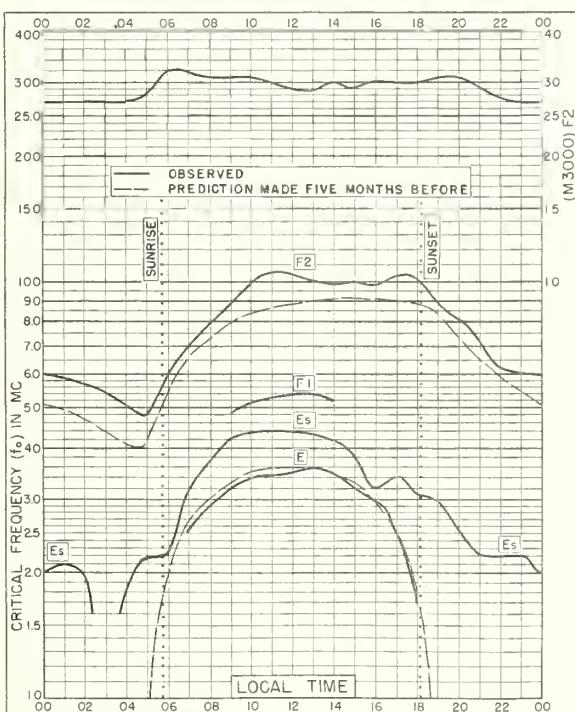


Fig. 59. FRIBOURG, GERMANY

48.1°N, 7.8°E

SEPTEMBER 1949

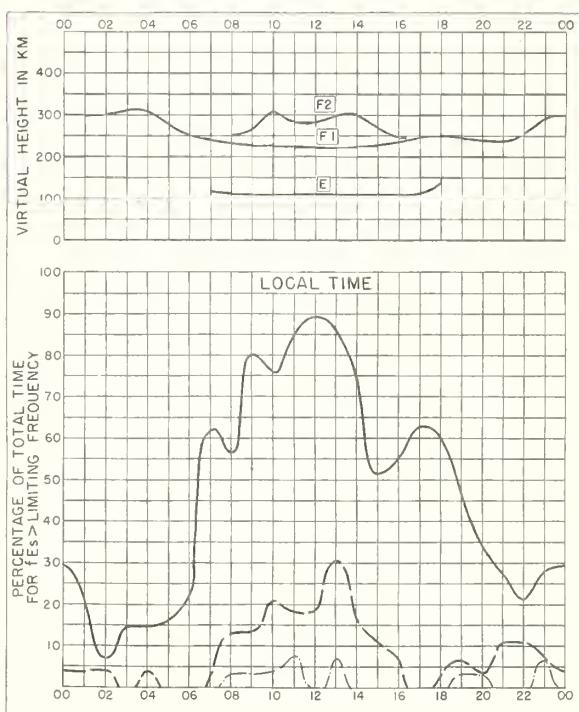
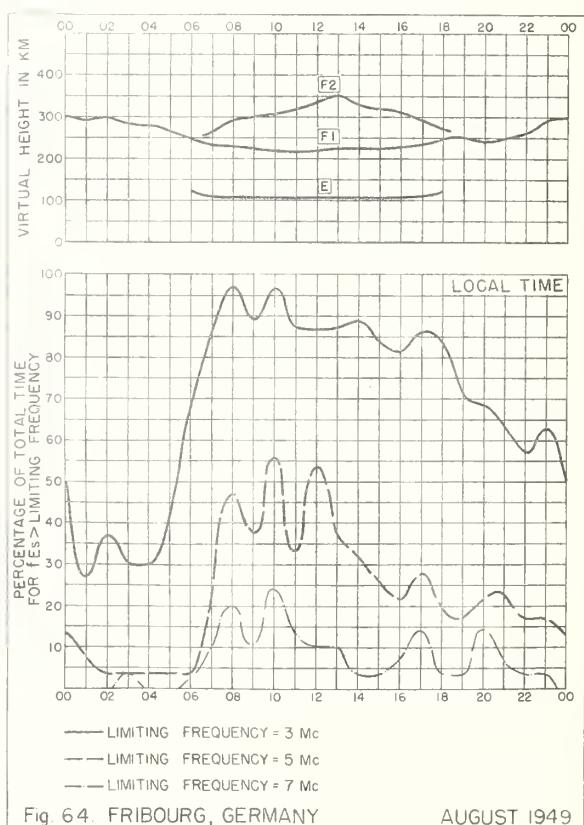
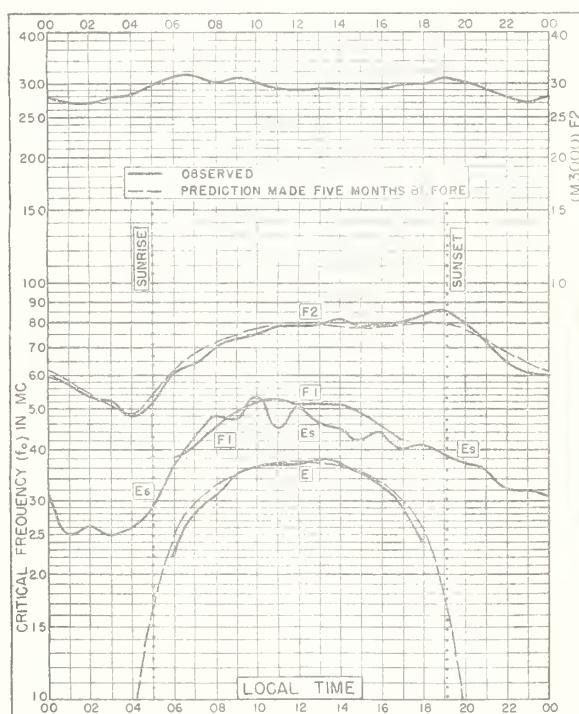
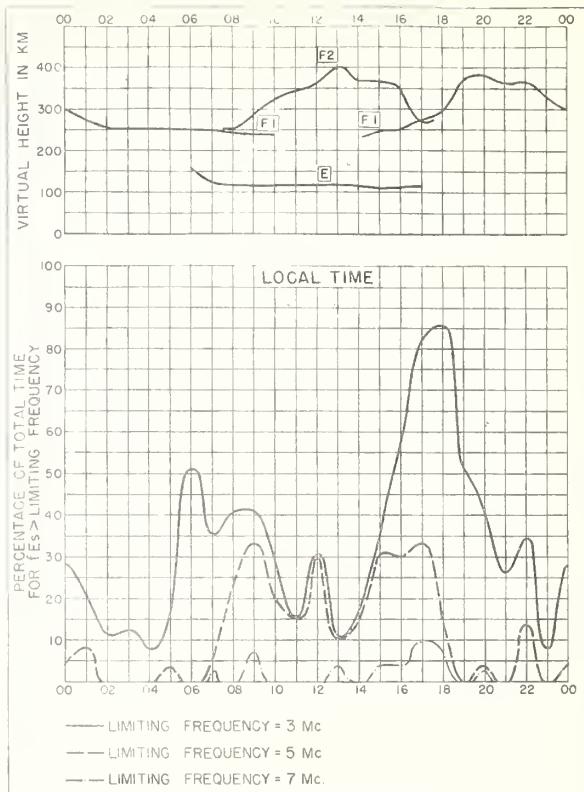
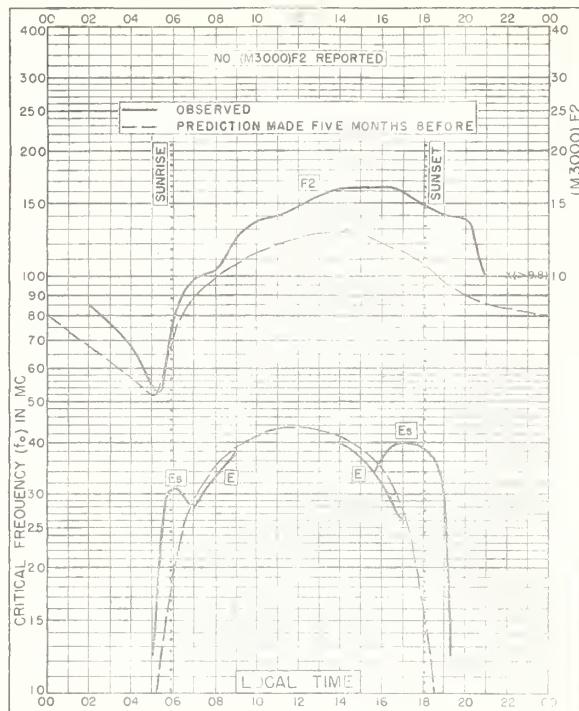
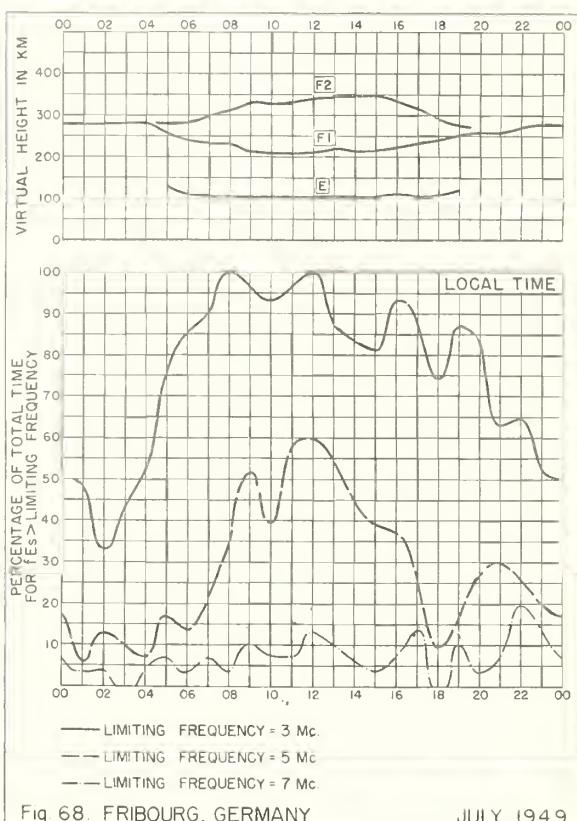
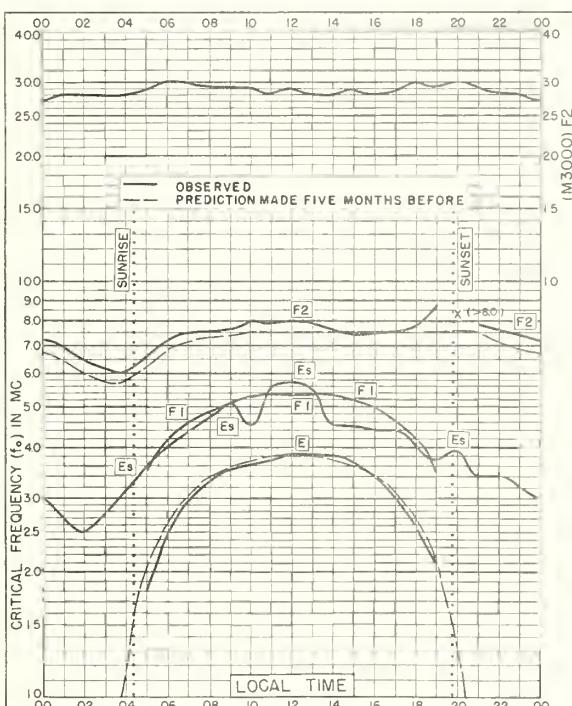
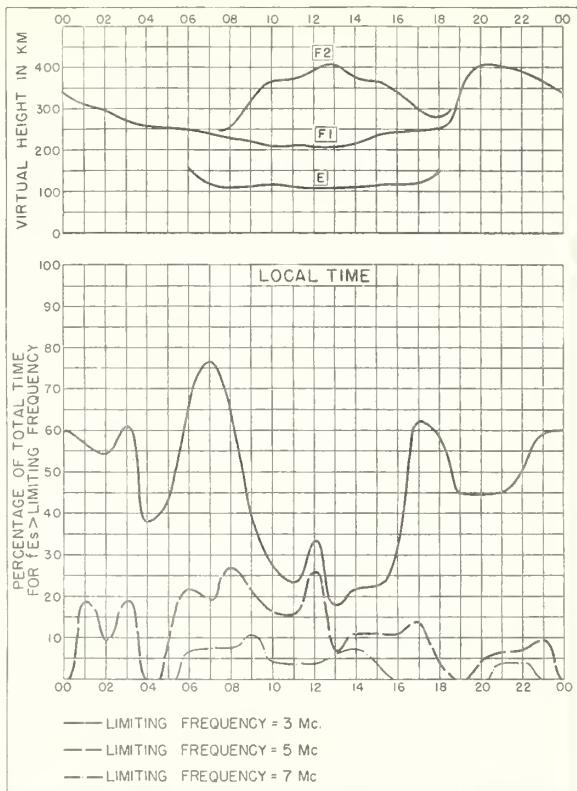
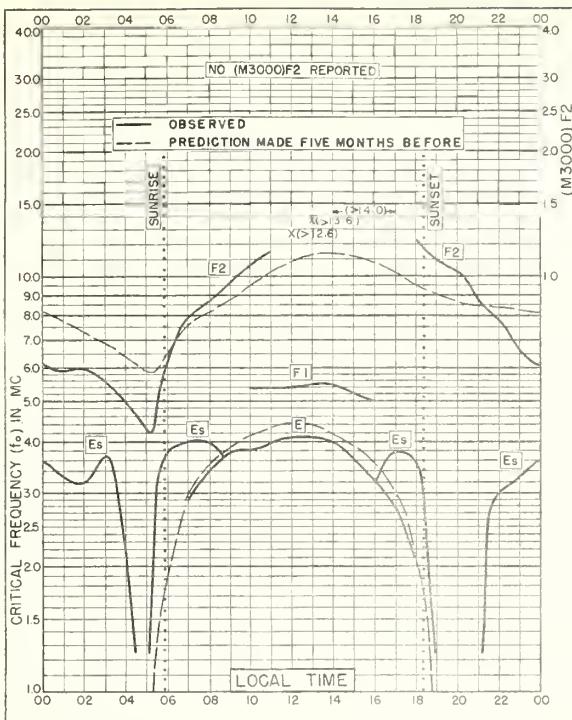


Fig. 60. FRIBOURG, GERMANY

SEPTEMBER 1949





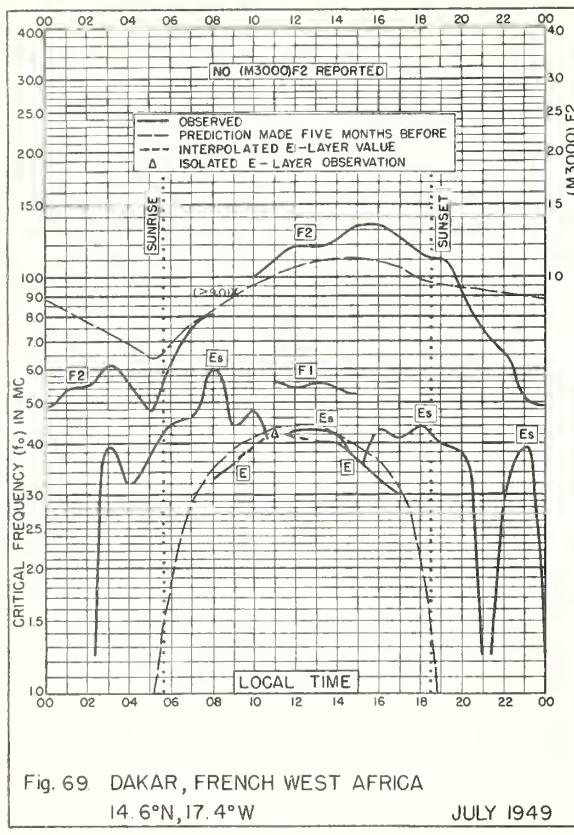


Fig. 69. DAKAR, FRENCH WEST AFRICA  
14.6°N, 17.4°W JULY 1949

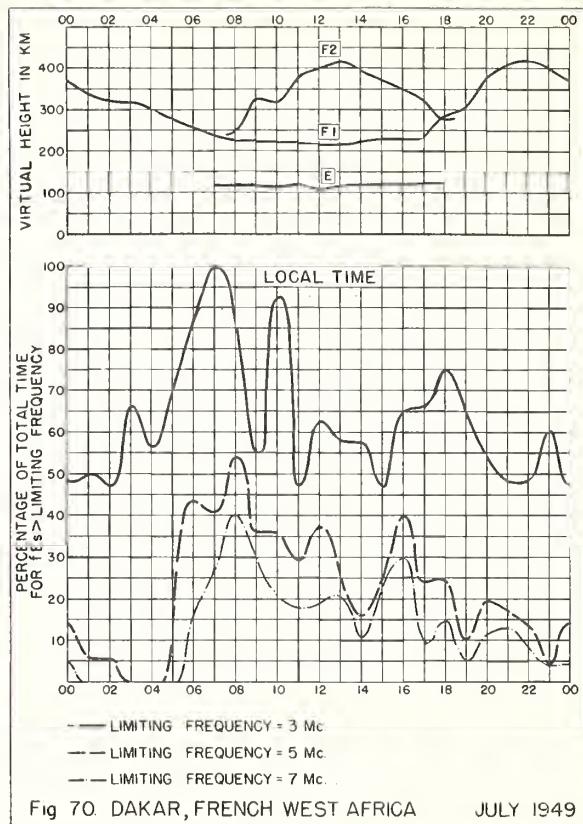


Fig. 70. DAKAR, FRENCH WEST AFRICA JULY 1949

Index of Tables and Graphs of Ionospheric Datain CRPL-F68

	<u>Table page</u>	<u>Figure page</u>
Baton Rouge, Louisiana		
February 1950 . . . . .	11	47
Boston, Massachusetts		
February 1950 . . . . .	11	46
Capetown, Union of S. Africa		
January 1950 . . . . .	13	52
Christchurch, New Zealand		
December 1949 . . . . .	13	53
November 1949 . . . . .	14	56
Dakar, French West Africa		
September 1949 . . . . .	16	60
August 1949 . . . . .	16	61
July 1949 . . . . .	16	62
De Bilt, Holland		
January 1950 . . . . .	12	50
December 1949 . . . . .	13	53
Fribourg, Germany		
September 1949 . . . . .	15	59
August 1949 . . . . .	16	60
July 1949 . . . . .	16	61
Fukaura, Japan		
November 1949 . . . . .	14	54
October 1949 . . . . .	15	57
Guam I.		
February 1950 . . . . .	12	49
Huancayo, Peru		
February 1950 . . . . .	12	50
Johannesburg, Union of S. Africa		
January 1950 . . . . .	13	52
Lindau/Harz, Germany		
January 1950 . . . . .	13	51
Maui, Hawaii		
February 1950 . . . . .	12	48
Okinawa I.		
February 1950 . . . . .	12	48
Oslo, Norway		
February 1950 . . . . .	11	45
Rarotonga I.		
November 1949 . . . . .	14	56
October 1949 . . . . .	15	59

Index (CRPL-F68, continued)

	<u>Table page</u>	<u>Figure page</u>
San Francisco, California		
February 1950 . . . . .	11	46
San Juan, Puerto Rico		
February 1950 . . . . .	12	49
Tokyo, Japan		
November 1949 . . . . .	14	55
October 1949 . . . . .	15	58
Trinidad, British West Indies		
January 1950 . . . . .	13	51
Wakkanai, Japan		
November 1949 . . . . .	14	54
October 1949 . . . . .	15	57
Washington, D. C.		
March 1950 . . . . .	11	45
White Sands, New Mexico		
February 1950 . . . . .	11	47
Yamagawa, Japan		
November 1949 . . . . .	14	55
October 1949 . . . . .	15	58

## CRPL and IRPL Reports

[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]  
*Daily:*

Radio disturbance warnings, every half hour from broadcast station WWV of the National Bureau of Standards.  
Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

*Weekly:*

CRPL-J. Radio Propagation Forecast (of days most likely to be disturbed during following month).

*Semimonthly:*

CRPL-Ja. Semimonthly Frequency Revision Factors for CRPL Basic Radio Propagation Prediction Reports.

*Monthly:*

CRPL-D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11-499—, monthly supplements to TM 11-499; Dept. of the Navy, DNC-13-1 ( ), monthly supplements to DNC-13-1.)

CRPL-F. Ionospheric Data.

*Quarterly:*

\*IRPL-A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.

\*IRPL-H. Frequency Guide for Operating Personnel.

*Circulars of the National Bureau of Standards:*

NBS Circular 462. Ionospheric Radio Propagation.

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

*Reports issued in past:*

IRPL-C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.

IRPL-G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.

IRPL-R. Nonscheduled reports:

R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.

R5. Criteria for Ionospheric Storminess.

R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.

R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.

R11. A Nomographic Method for Both Prediction and Observation Correlation of Ionosphere Characteristics.

R12. Short Time Variations in Ionospheric Characteristics.

R14. A Graphical Method for Calculating Ground Reflection Coefficients.

R15. Predicted Limits for 1/2-Year Radio Transmission Throughout the Solar Cycle.

R17. Japanese Ionospheric Data—1943.

R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.

R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)

R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.

R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.

R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.

R26. The Ionosphere as a Measure of Solar Activity.

R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.

R30. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Disturbance Reports to Replace T. D. Figures as Reported.

R31. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.

R33. Ionospheric Data on File at IRPL.

R34. The Interpretation of Recorded Values of  $fE_s$ .

R35. Comparison of Percentage of Total Time of Second-Multiple  $E_s$  Reflections and That of  $fE_s$  in Excess of 3 Mc.

IRPL-T. Reports on tropospheric propagation:

T1. Radar operation and weather. (Superseded by JANP 101.)

T2. Radar coverage and weather. (Superseded by JANP 102.)

CRPL-T3. Tropospheric Propagation and Radio-Meteorology. (Reissue of Columbia Wave Propagation Group WPG-5.)

\*Items bearing this symbol are distributed only by U. S. Navy. They are issued under one cover as the DNC-14 series.

